American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

FOUNDED 1880

SHOP AND OFFICE OF A PROGRESSIVE FURNACE DEALER

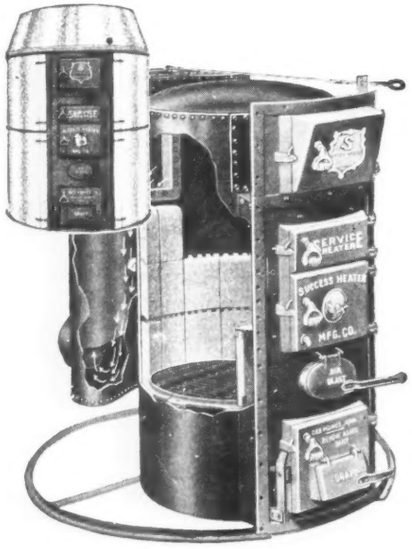
This picture shows the shop and office of the Baker Furnace Company, Toledo, Ohio. An idea of what is behind this business can be gained from the fact that in 1929 the Baker company sold 719 warm air furnaces, mostly in new homes. The interior is just as up-to-date as the outside.

APRIL 12, 1930

Every prospect in your territory will be *sold* on warm air heating and directed to *your* place of business

THIS is not fancy but fact. Last year Success dealers proved to themselves that this plan sells prospective buyers on the advantages of warm air heating and sends them into the shop ready to do business. The Big "Success" Idea is the most powerful dealer sales plan ever put to practical use. The Success plan is big enough, strong enough and consistent enough to do a good selling job. The big selling talk of the campaign stresses the advantages of *warm air heating* and identifies *you* as the heating expert in your community. It advertises your business. The manner in which these points are brought out builds up the quality (profitable) installation idea. Know all about the Big Success Idea—*see* this sales plan in its entirety—learn just why this better selling cooperation and Success high quality heaters will build better and more profitable business for you. Just tell us to send you the Big Success Idea *now*.

SUCCESS HEATERS



IF you could talk to every prospective buyer of a warm air heating system in your territory on the advantages of warm air heating—on the importance of a high quality installation and the merits and advantages of the high quality heater you handle—not once or twice but *eight* times wouldn't you get a great deal more business?

Sure you would, and as a Success dealer you can do this without any work on your part except furnishing the names of your prospects.

Write today for full details on the Success Heater line and the Success Heater Agency.

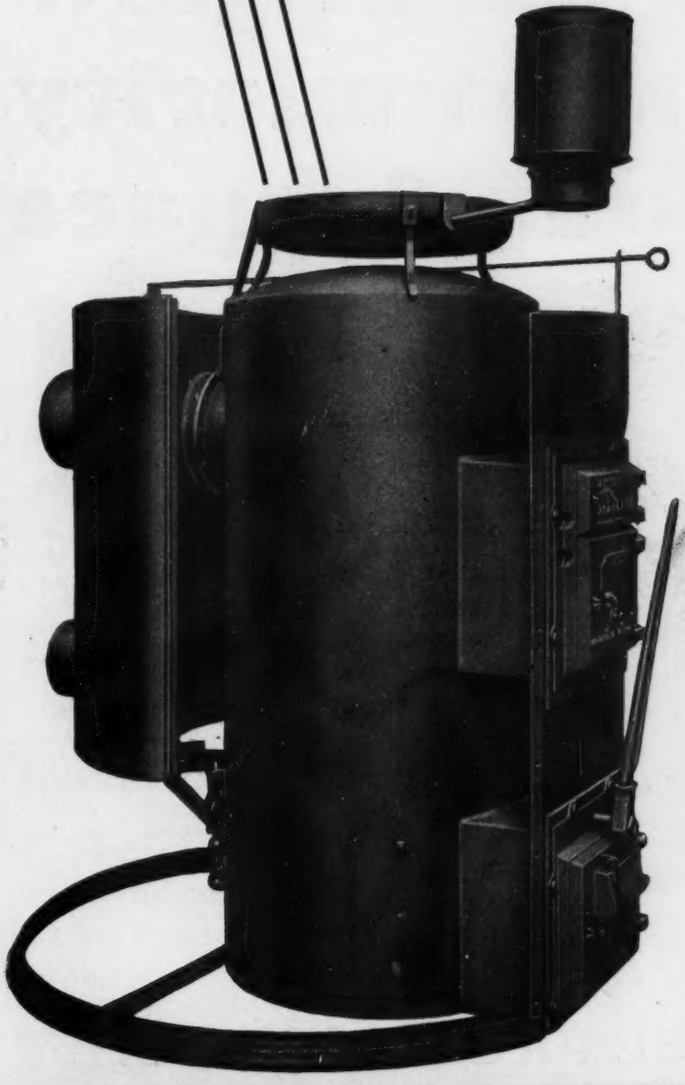
SUCCESS HEATER MANUFACTURING CO.
DES MOINES, IOWA

Some Dealers Make More Than Usual Profits—

There are two kinds of dealers who sell heating systems—one who installs the ordinary job at a low price without regard to profits or consideration for future business, and the other who sells his customers a high quality heating system that will give them real service, at a price which allows him an adequate profit for his work. The latter type of dealers are the ones who are making more than usual profits.

WATERBURY
SEAMLESS FURNACE
REG. U.S. PAT. OFF. PIPE OR PIPELESS

The Waterbury Franchise Helps Them Do It



The Waterbury Seamless All-Steel heating system is the one for your customers who want a heater that will give them many years of real comfort, efficiency, economy and freedom from trouble. Considering its exclusive features and many advantages, it is the cheapest heating system they can buy, in the long run. And they will pay the price for its added life and better service when you explain it to them. That is why the Waterbury Franchise helps you make more than usual profits.

Get into the class of dealers that are making real profits from their heating business. The Waterbury Franchise will do it for you, too. Send coupon below for complete information, and details of our sales plan helps you get this profitable business.

The Waterman-Waterbury Co.
1122 Jackson St. N. E. Minneapolis, Minn.

Complete Stocks Carried In

Philadelphia New Orleans Pittsburgh Chicago
Kansas City Tacoma San Francisco

THE WATERMAN-WATERBURY CO.,
1122 Jackson St. N. E., Minneapolis, Minn.

Please send me complete information about the Waterbury Franchise and your sales plan to help me get business.

Name .....

Address .....

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INDEX PAGES—18 and 58 [VOL. 99, NO. 8—$2.00 PER YEAR] BUYERS' DIRECTORY—54 and 56

Let the warm glow of WESTERN popularity increase your furnace profits

Pittsburgh, Pa.—Pittsburgh Furnace Parts Company.

Ravenna, Ohio—Ravenna Furnace Company.

Cincinnati, Ohio—Niehaus Furnace Repair Company.

Atlanta, Ga.—Moncrief Furnace Company.

Chicago, Ill.—Western Steel Products Company.

St. Louis, Mo.—MacRoy Supply Company.

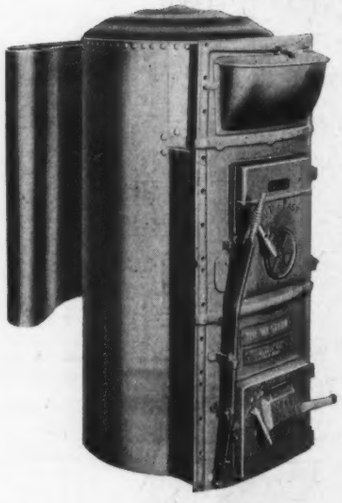
Kansas City, Mo.—Kansas City Furnace Company.

Duluth, Minnesota—Marshall-Wells Company.

Omaha, Nebraska—A. Y. McDonald Manufacturing Company.

Lincoln, Nebraska—A. Y. McDonald Manufacturing Company.

Sioux City, Iowa—A. Y. McDonald Manufacturing Company.



Fargo, N. D.—Fargo Cornice & Ornament Company.

Seattle, Wash.—McPherson Furnace & Equipment Company.

San Francisco, Cal.—Pacific Sheet Metal & Furnace Company.

Winnipeg, Man.—Marshall-Wells Company.

Saskatoon, Sask.—Wood-Vallance Company, Ltd.

Regina, Sask.—Wood Vallance Company.

Edmonton, Alberta — Marshall-Wells-Alberta Company, Ltd.

Minneapolis, Minn.—A. Y. McDonald Manufacturing Company.

Fort Dodge, Iowa—Leighton Supply Company.

Write for Information

WESTERN STEEL PRODUCTS CO.

132 Commonwealth Ave. . . . . Duluth, Minn.

THE NEW Automatic HESS

WELDED STEEL CONSTRUCTION

HERE is a furnace with grate surface of 338 sq. in. and for heat pipe area up to 590 sq. in., large enough for a large share of your furnace sales. It is automatic and comes complete with:

1. *Automatic humidifier—float valve type.*
2. *Automatic, electric, thermostatic control.*
3. *Electric booster blower, on stand, cord and socket.*

Furnished complete and standard with these features, it sells for little more than an ordinary furnace of the same capacity. Here is a furnace you can feature and which will sell to your customers on sight. We offer an exclusive dealer proposal outside of Chicago district or where we are not represented.

Hess Warming & Ventilating Co.
1207 South Western Ave. Chicago, Ill.

THE Hess Automatic Furnace Number 47A complete with thermostatic control, electric blower and automatic water pan. Sells complete for only $115.00. Ask for particulars and complete literature.

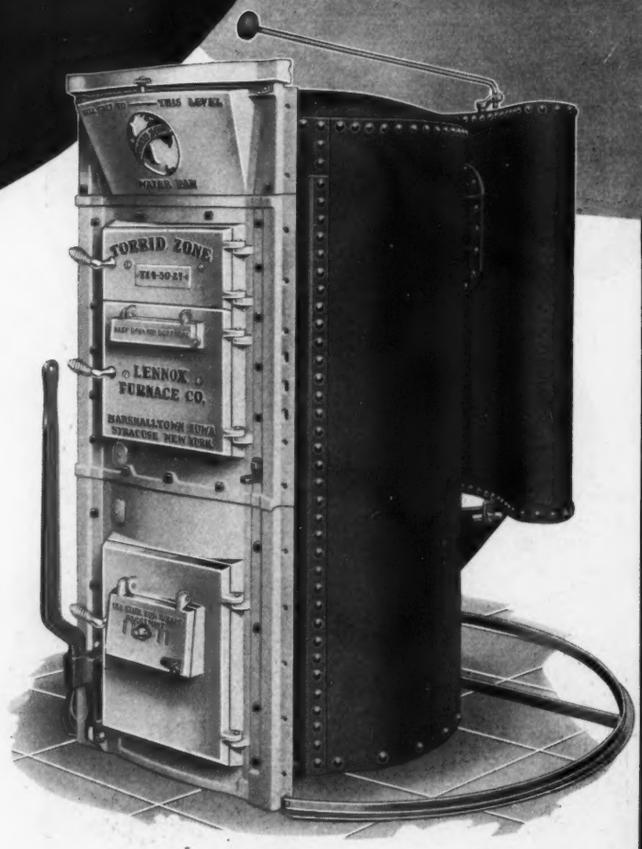
Hess Warming & Ventilating Company,
1207 South Western Ave., Chicago, Ill.

Please send me complete information on your dealer plan on the Hess Automatic Furnace.

Name .....

Address .....

Town ..... *State* .....



Build For A Permanent *and* Profitable Future *with*

LENNOX TORRID ZONE STEEL FURNACES

THE furnaces that you sell and install today will have a great deal of influence on the furnace sales you expect to make years hence. If each customer you sell remains enthusiastic about the wise investment he made in a home heating plant, the word will spread and new prospects will come to you for similar satisfaction.

Analyze the furnace you are now selling and compare it feature for feature with the Torrid Zone riveted steel furnace which during the past 32 years, has established outstanding records for long life, trouble-free service, and universal satisfaction to users. Then select the furnace that will make it easier for you to build a permanent and profitable growing business in future years. We will gladly furnish you the necessary Torrid Zone information to make these comparisons and reach your own decision.

Lennox Furnace Company, Inc.

Marshalltown, Iowa Syracuse, New York
Toronto—Winnipeg

Feature TORRID ZONE STEEL FURNACES

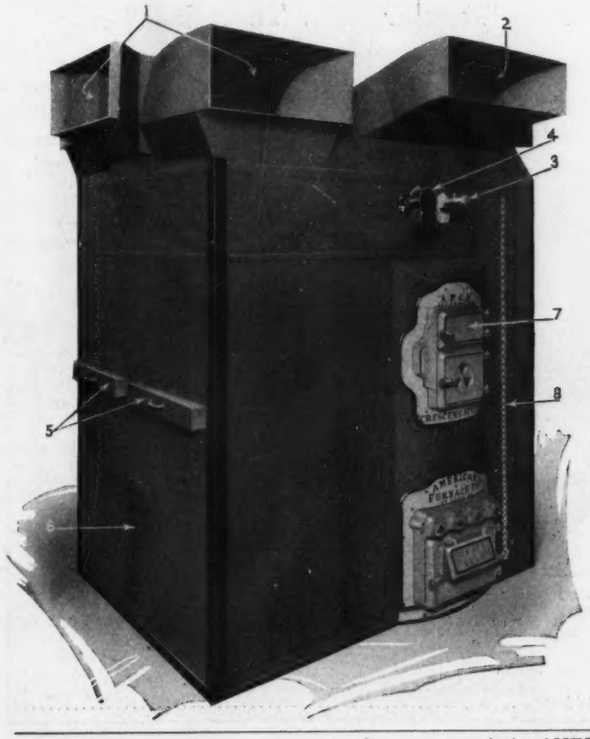
The Warm Air Heating Industry Has Long Sought The Ideal System... HERE IT IS

THE "AFCO" DE LUXE HEALTHFUL HEATING SYSTEM

THE constantly increasing demand for a healthful heating system which would satisfy all of the comfort requirements in the modern home, makes the "AFCO De Luxe" Healthful Heating Unit just the thing for dealers who want to take advantage of this profitable business.

All of the requirements for the ideal home heating system have been combined in one compact unit, individual experiments and guesswork have been eliminated and satisfactory performance assured.

The "AFCO De Luxe" Healthful Heating Unit is available for all sizes of homes. It is shipped complete with each part plainly marked for easy assembly. To learn more about this new complete comfort unit, write for full details without obligations.



Note These Features:

1. *Air Supply Inlets*
2. *Warm Air Outlets*
3. *Automatic Humidifier*
4. *Automatic Furnace Fan Control*
5. *Air Filters*
6. *Convenient Cabinet Door*
7. *Genuine "AFCO" Boiler Plate Furnace*
8. *Chain to Automatic Draft Control.*

Write to-day for free folder

American Furnace Co.

2719-31 Morgan Street

St. Louis - - - Missouri

When sales are hard to close—

this quality and this outstanding feature

will make your business show a profit.

THE ATH-A-NOR PIPE AND PIPELESS FURNACE

ATH-A-NOR quality appeals to prospects because it looks as good and practical as it is.

And the Three-Way Air Blast feature is an exclusive construction that makes folks realize that only with an Ath-A-Nor can they secure such powerful and economical heating results. Because the Ath-A-Nor Three-Way Air Blast creates complete combustion it is

SMOKELESS

Put an Ath-A-Nor on your sales floor and watch prospects prefer it. Besides the Ath-A-Nor the May-Fiebeger line includes several styles and a complete range of sizes in both cast iron and steel furnaces. Every May-Fiebeger furnace is high grade and reasonably priced.

The May-Fiebeger Co.
NEWARK, OHIO

The
MUNKEL GAS ATTACHMENT
Burns Gas Economically

BUILT TO LAST

Create New Business

Make Profits in the Off Season

FITS ANY COAL FURNACE

Install a Real Gas Unit to That Coal Furnace

We Heat Both Units When Burning Gas.
Long Fire Travel and a Large Radiating Surface.

Write for Circular and Prices

Shipped Complete Ready for Installation.

THE MUNKEL-RIPPEL HEATING CO.
"31 Years of Service"
COLUMBUS, OHIO

BRILLION *FURNACES*

More Popular NOW Than Ever Before!

THE ever increasing popularity of Brillion furnaces is due to just two things.

Unusually High Quality—
Out of the Ordinary Low Price—

Look over the Brillion—notice many of its fine features and quality design from the illustration. Hundreds of progressive dealers are making better profits by selling the Brillion.

Brillion quality commands a price in excess of that received from furnaces which cost you more.

Send the coupon today sure

BRILLION FURNACE CO., 3215 Elston Ave., Chicago.
200-300 Park Ave., Brillion, Wis.
Send me full details and Catalog No. 80.

Name .....

Address .....

Mr. Edward Brandes, Madison, Wis.

". . . the old time religion is good enough for me and so is Premier . . . I haven't a complaint in the world and there is a lot I would praise if I could find time to sit down and write it out . . ."

ED.

"Thanks for your letter. Haven't any time to write any ad for you, or even part of one. Just tell them that I'm selling your goods and that I think you and the furnace are both absolutely O. K.—and I do. Fix it up any way you want."

CARL.

Mr. Carl Roelle, Columbus, Nebr.

What I Think of Premier

by FOUR MEMBERS of the
Premier Dealer Merchandising Board
PREMIER WARM AIR HEATER CO.
Dowagiac, Michigan

Mr. Carl Mueller, Findlay, Ohio

". . . when better furnaces are built, Premier will build them. That's a slogan you ought to buy away from Buick. Certainly are my sentiments anyway. Tell Fred. I sold that job we were out on."

CARL.

". . . what I think about the whole thing is that the Premier proposition is the best there is. If a man wants to make money, he couldn't want anything better than your furnace and plan. I've sold them by the hundreds and I know . . ."

ALEX.

Mr. Alex Friedman, Detroit, Mich.

"Old Wine in New Bottles"

LONDON BOILER PLATE *Quality Plus* FURNACES

ARE COLD RIVETED AND WELDED SMOKE, GAS AND FUME TIGHT.

ARE EQUIPPED WITH EITHER DUPLEX BASKET DUMP, TRIANGULAR OR DRAW-CENTER.

GRATES AND RADIATORS

FOR
SOFT OR HARD COAL, COKE OR OIL

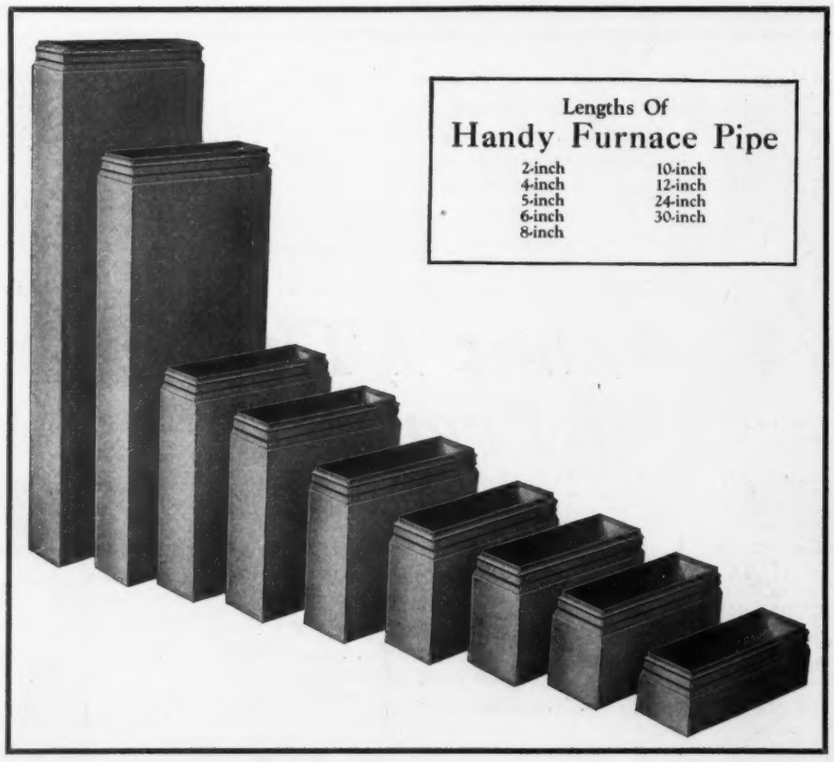
"Feather Your Nest"—
Write Today for Proposition

The London Furnace Co.

LONDON, O.

THOS. W. PEARSON—Sales Manager

Say you saw it in AMERICAN ARTISAN—Thank you!



HANDY PIPE!

Made Good Enough To Outlast The Buildings It Goes Into.

Embodying Construction Features That Make Its Use Symbolic Of Its Name.

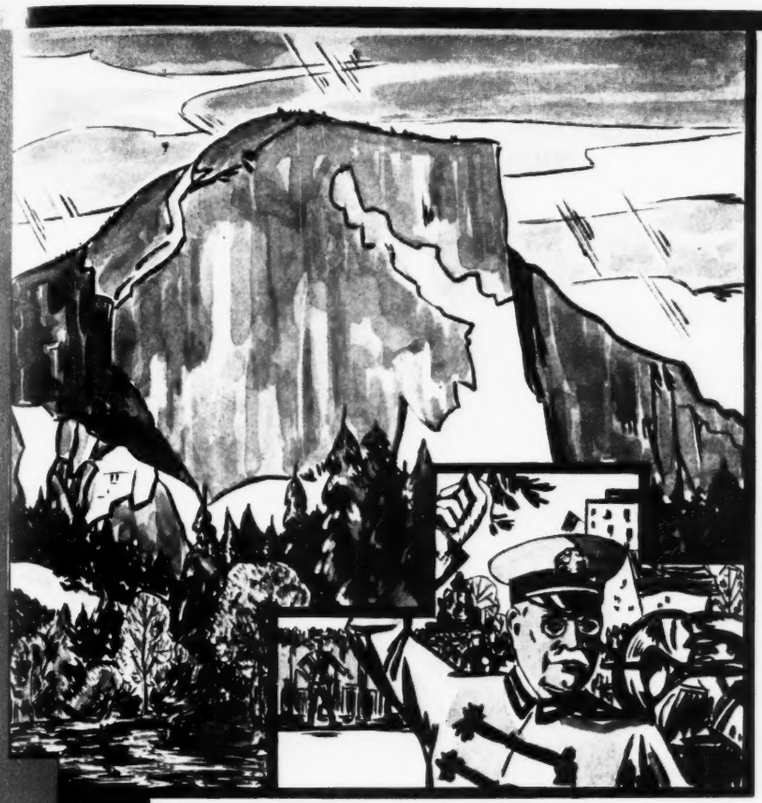
Sold Thru Jobbers So Wide-Spread That, In Another Way, Its Name Carries A Meaning.

HANDY

By Name
To Use
To Get

F. Meyer & Bro. Co.

Peoria **Illinois**



A SYMBOLIC PRESENTATION of the MIDLAND EL CAPITAN

BECAUSE the Warm Air Furnace is a unit of health and comfort to the home, we feel that a symbolic presentation would bring to the mind of a warm air heating specialist a better picture than so many rivets, nuts or bolts.

Picture, if you can, the massive beauty of EL CAPITAN Mountain, located in sunny California; picture its permanency, its untold beauty, and how it rises far above the surrounding country, monarch of the domain over which it reigns.

Now in a flash, let your mind turn to John Phillip Sousa, whose masterpiece, "El Capitan," has stirred the feelings of many. Apply all these things to the Midland EL CAPITAN. You have a monarch among furnaces, a furnace of permanency, of beauty, of comfort and satisfaction. Indeed, the Midland EL CAPITAN is a masterpiece well associated with the "El Capitan" of the noted composer and leader, John Phillip Sousa.

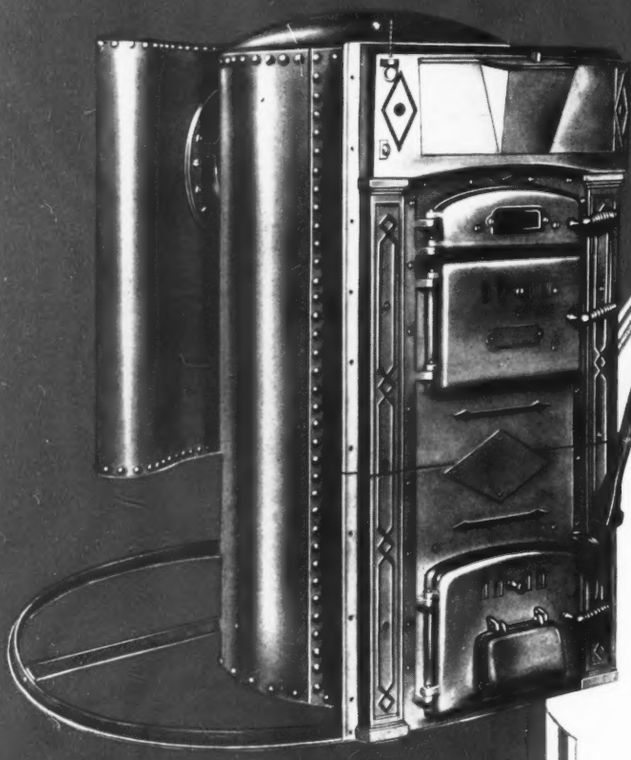
This is our symbolic presentation of the Midland EL CAPITAN and pictures in a way the reason it has gained leadership over all other steel furnaces and is proclaimed "Tomorrow's Furnace Made Today." You are invited to learn more about the EL CAPITAN and the cooperation and sales plans behind it. Write today.

MIDLAND FURNACE COMPANY

COLUMBUS OHIO

MIDLAND STEEL RIVETED and CALKED IS BEST FURNACES

OVERCOME THE BUGABOO OF POOR BUSINESS WITH THE MIDLAND ELCAPITAN



Notice this furnace for its superior quality and unusual beauty. Note the symmetric and beautiful front — its sturdy construction — its scientific build.

All the important and advanced 18 points of the Trusteel, added to by further scientific construction, give you the EL CAPITAN, America's finest steel furnace—a furnace your customers will be proud to own and operate.

MIDLAND FURNACE COMPANY
COLUMBUS

Business is Good!

ONLY THOSE WHO DO NOT WISH TO MAKE IT SO, FIND IT OTHERWISE

That is what Midland dealers are saying everywhere. They have overcome the bugaboo of poor business with EL CAPITAN and others of the Midland line.

Co-operation from the manufacturer to the dealer has done this work. Midland dealers everywhere have gained leadership. They are all finding business GOOD and are making a better profit.

It will pay you to investigate the Midland dealer plan.

1930 Midland co-operative plans are new and different and bring to the dealer a better and more profitable system of selling furnaces.

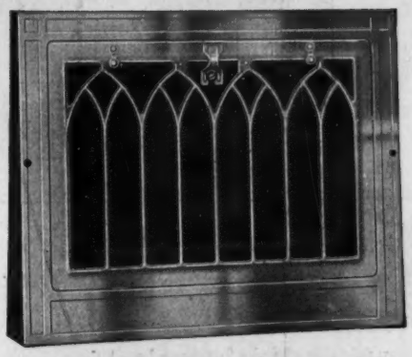
Let us tell you all about these unusual plans and why 1930 is a Midland year.

MIDLAND FURNACE COMPANY
OHIO

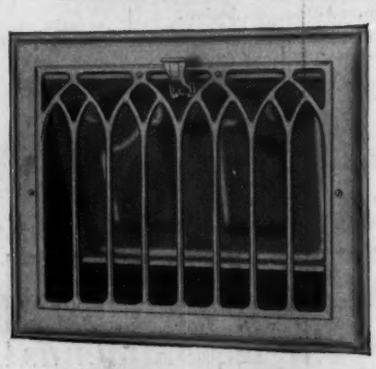
1930 IS A MIDLAND YEAR

MIDLAND STEEL RIVETED and CALKED IS BEST FURNACES

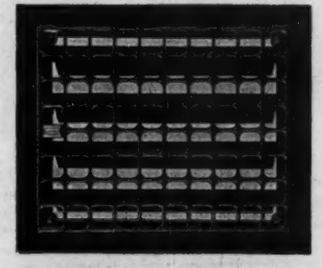
PLAY SAFE—Ride with the Leader!



No. 110
BASEBOARD REGISTER



No. 310
SIDEWALL REGISTER

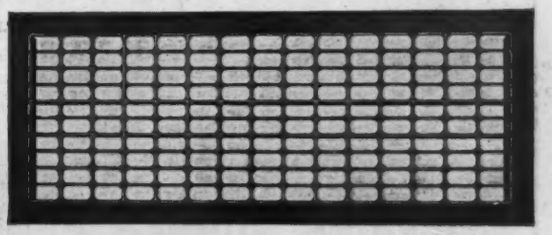


No. 200
STEEL FLOOR REGISTER

AGAIN Hart & Cooley offers you a powerful assistant to help you land the better jobs—a new series of baseboard and side-wall registers with baseboard ventilating plates to match, far more beautiful than any previously obtainable. The 110 series strikes a modern note. It keys in with the modern trend in interior decorating and is what no other register has ever been—a real decorative feature as well as a thoroughly efficient register. And that makes a whale of a difference when selling the better class of homes.

First to manufacture registers of unbreakable wrought steel; originators of the "pinched back" construction and bar type register that provided far greater air capacity and savings though the use of smaller registers, Hart & Cooley has continually led in furnishing the trade with features that constitute real selling advantages. Play safe! Ride with the leader and keep a step ahead of your competitors. Standardize on the H & C line.

By all means see the new 110 series. There's a jobber near you who has the line, or soon will have. If you do not know his name drop us a line.



No. 651
BASEBOARD INTAKE

No. 255
STEEL COLD AIR FACE

HART & COOLEY REGISTERS

— THE AIR CAPACITY LINE —

Made by HART & COOLEY MFG. CO.

CHICAGO—61 W. Kinzie St. NEW BRITAIN, CONN.—Corbin Ave.

Philadelphia, 1600 Arch Street — New York, 101 Park Avenue — Boston—75 Portland Street — Nashua, New Hampshire

Factories at Holland, Mich., and New Britain, Conn.

— ALSO A COMPLETE LINE OF FURNACE REGULATORS, CHAIN PULLEYS, DAMPERS, ETC. —

Say you saw it in AMERICAN ARTISAN—Thank you!

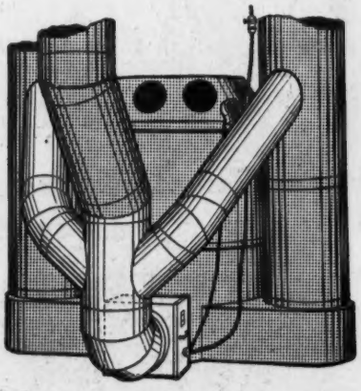
Write for full details and names of nearest jobber.

A-C *Thermostatically Controlled*

Automatic

HEAT BOOSTER

THE silent, efficient and economical furnace fan. The A-C is *different* and *better* and therefore popular with the trade. Let us tell you how the A-C increases sales and profits in warm air heating. Ask for our installation instructions. The A-C has no louvers—does not interfere with gravity operation, and is *completely automatic.*



A-C MANUFACTURING CO., 417 Sherman St., Pontiac, Ill.

Your prospects will prefer the—

GILTEDGE FURNACE

and *you* will prefer the profits and prestige the agency brings you

R. J. SCHWAB & SONS CO.
283 Clinton Street Milwaukee, Wis.

---

only $48 installed

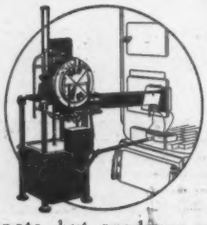
Yet Four Exclusive Features

1. Automatically checks furnace in event of electrical current break.
2. Automatically re-engages after fueling.
3. Three Minute Automatic Action.
4. No gears, electric motors, clocks or dry batteries—nothing to oil.

Thousands are in use.

SHEER COMFORT *heat Regulator*

Ask your jobber or write
H. M. Sheer Co., 213 Hampshire St., Quincy, Illinois



McILVAINE OIL BURNER

Listed by Underwriters

Adaptable to warm-air furnaces because the McILVAINE System of **continuous flame** insures no cracking or burning of fire pots, but produces **even, dependable heat.**

Not an Intermittent Burner

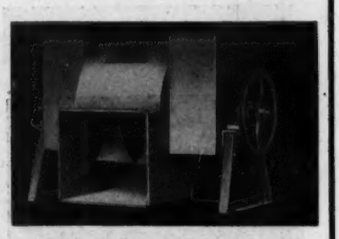
DEALERS: Write for information today.

McILVAINE BURNER CORP.,
Dept. A, 747 Custer Ave., Evanston, Ill.

Furblo *The Furnace Blower Everyone Recommends*

MANUFACTURERS have adopted FURBLO as standard equipment — jobbers catalog FURBLO exclusively — dealers everywhere find FURBLO the one and only satisfactory solution to the problem of mechanical warm air heating.

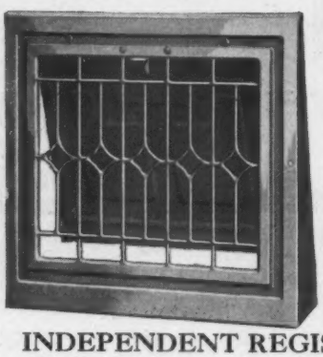
FURBLO is not a fan—but a *blower. Quiet, efficient,* powerful, sturdy, dependable. Guaranteed to always produce on even the hardest job.



LAKESIDE COMPANY, Dept. 4
Hermansville, Michigan
Makers of Lakeside Ventilating Equipment

Two sizes fit practically all installations. Send for complete information.

INDEPENDENT REGISTERS



VENTILATORS
GRILLES

Any Size
Any Finish

Our new catalogue will interest you. May we send you a copy?

INDEPENDENT REGISTER & MFG. CO.
3747 E. 93rd St. Cleveland, O.

NOW you will KNOW your costs

BEGINNING with this issue, American Artisan begins a series of articles on COST ACCOUNTING. This course of instruction will be written by J. G. Dingle, C. P. A., who has had many years of experience in working out bookkeeping and cost problems for sheet metal and furnace men.

See that your bookkeeper reads these articles.

REMEMBER THIS-

Whenever you hear streaked walls mentioned it's your cue to mention NO-STREAK REGISTERS

Many dealers make good profits just by replacing old registers with NO-STREAK and OUT-O-WALL registers

NO STREAK

They permanently prevent the walls from becoming streaked

ROCK ISLAND REGISTER CO.
ROCK ISLAND - - ILLINOIS

ROCK ISLAND REGISTER COMPANY,
ROCK ISLAND, ILLINOIS
Send me your catalog and price list.

Name .....

Street and Number .....

Town ..... *State*.....

Sell Modern Heating with the-- FARRIS WATERBASE FURNACE

A high quality furnace in every respect PLUS guaranteed humidity and air cleaning

FARRIS FURNACE CO., SPRINGFIELD, ILL.
Send me full details and dealers' proposition on the Farris Waterbase.

Name .....

Address .....

City ..... *State*.....A.A.

Careful buying on the part of the public should mean careful buying on *your* part.

"FLORENCE"

The Original Hot Blast Furnace gives extra value

IT IS SMOKELESS

IT burns the cheapest grade of coal—turns it into coke leaving very little ash.

The original hot blast design is a *real* hot blast which positively controls the draft *above* and *below* the fire.

It turns all soot, gases and smoke into *extra* heat units—saves money and provides *clean* heating. Public demand for quality is constantly growing. You can sell the Florence easier because it is better.

C. EMRICH CO. (Since 1861) COLUMBUS, OHIO

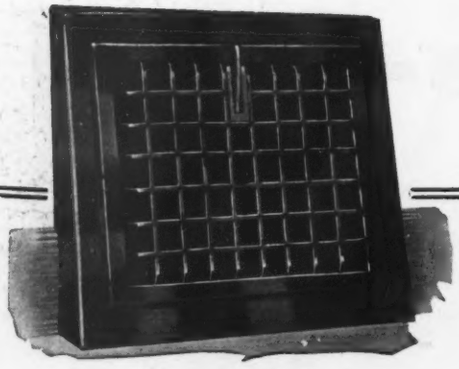
Mail this Coupon Today

C. EMRICH CO., COLUMBUS, OHIO
Send me your catalog and prices on Florence furnaces.

Name .....

Street and Number .....

City ..... *State*.....A.A. 4-12



The AUERISTOCRAT

of all registers, combining air capacity, decorative and concealing features.

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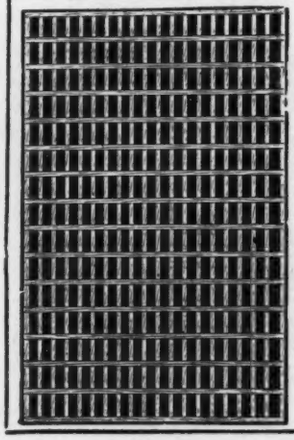

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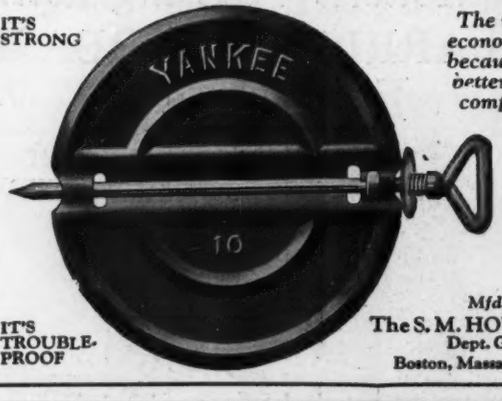

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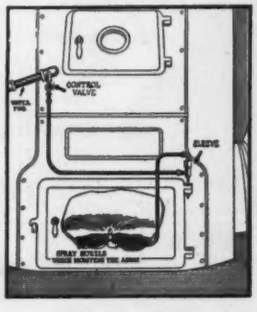

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American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

Vol. 99 CHICAGO, APRIL 12, 1930 No. 8

OIL BURNERS AND THE FURNACE DEALER

THERE is being staged this week in Chicago the annual convention and exhibit of the American Oil Burner Association.

In this exhibit, where more than 100 firms displayed their wares and where numerous booths had a burner set up in a heating plant, only THREE exhibitors showed their burner in a warm air furnace.

To our mind, this situation is pregnant with possibilities. Why should the furnace, which is the heating system for millions of homes, be relegated to the background by an industry which must depend for its very existence in making less laborious the heating plants already in operation?

The answer seems to lie in two basic causes. We might just as well be frank about the situation. First off, the oil burner industry is afraid of the warm air furnace. And secondly, the oil burner folks have tried to make the warm air furnace dealer over into a salesman of oil burners and have failed.

Let's analyze this situation a little closer.

Are the oil people afraid of the warm air furnace? We talked this over with probably twenty-five of the exhibitors. At least two-thirds of those interviewed were straightforward in saying they were. Not that they won't sell a burner to a man with a furnace, but they don't want to and won't if they can sell someone else.

Why don't they? Because they don't know what a furnace will do under oil heat and because it makes trouble. Evidently there is a great field for the furnace man who will design and build a furnace primarily conceived for an oil burner.

But we believe the answer goes deeper. Their salesmen are specialty salesmen. They are not heating men. They can sell and perhaps install a burner, but they couldn't figure out a heating plan for a home if their life depended on it. They have trouble with furnaces because they don't know heating. What they want is a heating plant in which they can install a burner and forget about it.

Then let's look into this thing of using the furnace man as a salesman. We asked over and over again, "Why don't you use the furnace man as your dealer?" And time and time again we got the reply, "Because he can't or won't sell burners at the rate we have to turn them over. We have to have specialty salesmen."

Now only reasonable study should convince the reader that when an industry has to use specialty salesmen to attain the required volume either one of two things are true. Either the commodity is ahead of its time or the industry is over-producing.

If we can take as true the statement that there are more than 60 burners being sold in the city of Chicago, there would seem to be room for argument over the second conclusion. About the first, we don't know.

Here, it seems to us, is a situation without parallel in the heating field. On the one hand we have a furnace man who is trained to install furnaces according to a code which when followed almost automatically insures a house which is adequately heated. This same man has been heating homes for years or even generations. This man represents an industry which is one of the most essential in American home construction. At this man's hand is a heating system which is recognized and is being accepted by the public and heating authorities as the IDEAL heat for a home.

And set right against this man and his system and his code is a theorum that this same man can't sell oil burners because he isn't a specialty salesman.

Now in fairness to the oil burner industry we must admit that the burner industry has tried again and again to make the furnace man a successful salesman of burners. And we must also admit that to date their efforts to make him a salesman of their type has been mostly crowned with failure.

It seems to us that the answer is that out of the mass of furnace men there must emerge a strata of heating men who can see that heating is not the cementing of one casting on another or the connecting into the furnace of a series of pipes, or that heating a house is not merely following the standard code and putting in the cheapest job possible.

What is needed is a furnace man who can see heating in its true picture. And that picture is automatic heating.

This furnace man who is to emerge will be a heating engineer. We're not talking about college men, but we are talking about a man who when called in can advise the home owner on heat. Of course, he will sell warm air heating, because that will be the ideal heat of the future. But in addition to a warm air furnace he will sell that prospect all the things which

(*Continued on page* 48)

What Is *Cost Accounting?*

The Furnace and the Sheet Metal Industries Need Better Bookkeeping. Competition Cannot Be Eliminated, But It Can Be Educated. The American Artisan Begins Publication of a Series of Articles on Keeping Costs.

IN an article appearing in this paper on December 28, 1929, I dwelt upon the importance of Cost Accounting. It is now my desire to bring you a more perfect understanding of the term "Cost Accounting."

It is a rather common expression in the business world of today, but I doubt the ability of the average business man to define "Cost Accounting." Without a clear conception of its meaning we cannot make progress through the application of

Joseph G. Dingle, C. P. A.

better cost accounting procedure in individual business.

Our trade papers are read by live, progressive business men because they have come to realize that success is a direct result of hard work combined with study of their business. There have been pages and pages devoted to "Cost Accounting," "Overhead" and similar subjects. Practically all of these articles, however, are based upon the idea that readers are thoroughly acquainted with the principles of cost accounting. I want to tackle the problem in another way. You will pardon me if I proceed on the theory that you do not fully understand bookkeeping. It is a very vital part of your business activity and no harm can come from reviewing the subject in some of its elementary parts.

Cost accounting is bookkeeping applied to a higher degree. Its purpose is to permit the business man to analyze his sales dollar in such a way as to recognize its principal components. After such analysis Mr. Business Man can locate the leaks and inefficiencies. Having located these faults, his efforts can be devoted to correcting them.

The origin of bookkeeping is lost in antiquity. We know it was used in Egypt in the dim past. It has ever been a part of the business world. Yet it is surprising how little of the subject has really been absorbed and applied by the business man. He still considers it something necessary in his business, but leaves it up to his bookkeeper. When the business man comes to realize that his bookkeeper produces figures which, when used intelligently, can greatly improve his business ability, a great step will have been taken. The education of the business man in bookkeeping is, in my opinion, the greatest need of the business world today.

The principle of double-entry bookkeeping, almost universally used today, dates back many centuries. A double-entry ledger was used in Genoa in 1340. There is in existence an old ledger, used in 1419, which is but little different from those now in use. The first published treatise on double-entry bookkeeping was written by Lucas Pacioli, a Franciscan monk, in Italy in 1494. Double-entry bookkeeping is so called because it considers a transaction from two angles, the disposition as well as the source.

Some of the terms peculiar to bookkeeping may be stated and defined here to good advantage. A set of books consists of one or more journals and one or more ledgers. Business transactions are first recorded in the journal and ultimately reach the proper section in the ledger. A journal usually has two or more columns, and may be compared with that part of your shop

Bookkeeping is not new. The Egyptians used it in transferring sheep for gold, jewels for land, wives for other wives.

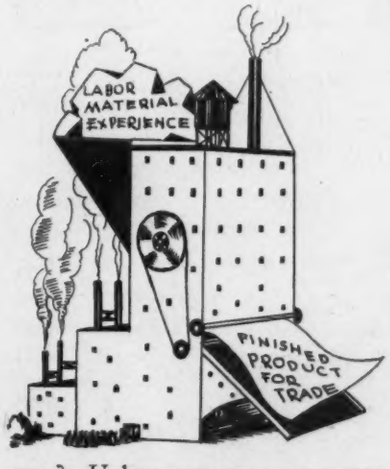
where you assemble your work. The journal is in reality a recording sorting rack. Transactions are recorded and sorted for further use. Here every single transaction of the business must come, to be carefully and accurately recorded, and sorted according to its two aspects. No transaction arises but can be reduced to a simple statement of the passing of value from one place to another. In bookkeeping these transactions must be recognized, analyzed and recorded in the journal as they occur.

The ledger is composed of accounts. This book may be likened to your material bins and racks. You have these bins and racks in your shop in order that you may place in or on them your goods according to their sizes and kinds, to enable you to find them quickly when wanted. Likewise, in the ledger we have accounts, suitably named and arranged to permit of placing therein such transactions as occur, in order that the like transactions may be grouped and totaled.

The design and layout of journals and ledger accounts may be compared with the architect's plans and specifications. The plans, like the ledger accounts, show the purpose to be accomplished. The specifications, like the journals, provide the plan for accomplishing the work. The more accurate the plans and specifications, the better they can be followed. If complete and accurate, they define and describe in complete detail a building in all its parts. A complete and well defined set of journals and ledgers describe in detail the business activities and, if well kept, will show the condition of the business at all times, and, in addition, will fully explain what changes have occurred.

A journal is only a collection of paper sheets which serve the same purpose as a series of trays in which bills, receipts, etc., can be piled until they are put in some permanent place. You could have a journal just like this desk if you wanted it.

Business may be defined as trading. In trade, we supply the wants of others. To do this we must assemble wares and equipment and be prepared to fabricate those articles our customers desire. Let's take a close look at our own business activities. Your first move was to get together some capital, or cash. You obtained this cash from some source and placed it in your bank. This much you will show. You started business with a certain sum of money in the bank. Where is it



now? Unless you are a very unusual man, you will have to admit you don't know.

Let's call that putting money in the bank your first transaction, and proceed with your bookkeeping education. Transactions require journal entries to properly record them. You might write this transaction and say you put $3,000.00 in the First National Bank, which money you obtained from the sale of some property—say a rent house. That would state the transaction in a way, but not quite as concisely as it can be stated. We have one definite rule in bookkeeping. This rule enables us to analyze each transaction and state it briefly, but concisely. That rule may be stated here as "Debit the Disposition and Credit the Source."

The bookkeeper looks at the transaction involving your $3,000.00 cash and fits it, by means of the rule above, to two accounts. The result is a debit to the bank and a credit to your capital account. The first entry results in charging (or debiting) the bank with $3,000.00 and crediting your capital account with a like amount.

Your ledgers are permanent places of record for your transactions. You could build a file on your wall and make it serve as a ledger, but it would be far too cumbersome.

You can, I am sure, see clearly the application of the rule of debiting the disposition and crediting the source. You put the $3,000.00 in the bank—the disposition—and have debited that account. You have set this money apart as the capital of your business. Your capital account, then, is the source of this fund and is therefore credited.

I hope you can clearly see this transaction and the application of the debit and credit sides of the journal entry required. A clear understanding of this simple rule is absolutely necessary to understand bookkeeping.

You are now ready to consider the next transaction. Let us assume it to be the leasing of a suitable building and the payment of the first month's rent. You give a check to your landlord for, say, $50.00. Do you see the journal entry? What have you done? You drew a check for $50.00 in payment of Rent. Apply the rule and we have: Debit Rent and Credit Bank —$50.00.

You now have $2,950.00 in the bank and the use of a building for

a month or rent—$50.00. There has been no change in your capital account. You put in $3,000.00 and have not reduced it. You have merely moved some of the money from the bank into rent. Rent is here considered as a part of the service you are going to sell your customers, but, if you do no business, your rent money is consumed by the passing of time and you have not had an opportunity to pass it on.

You remodel the building, purchase and install some machinery, purchase materials and supplies, and hire your workmen. Each transaction requires a journal entry. By applying the rule we have no difficulty in analyzing the transactions.

Oh yes, you are saying, you don't pay cash for the machinery. You pay a small part in cash and give notes for the balance. How do you enter that transaction? By the same old rule. You have purchased machinery costing $1,000.00 and paid $200.00 cash and 8 notes for $100.00 each. Debit the disposition—Machinery—$1,000.00, and credit the sources—Bank $200.00 and Notes Payable $800.00. Again I hear you saying that the materials and supplies are not paid for at the time, nor do you give notes. You bought them on open account. Apply the rule and you have an entry. Debit Materials and credit Accounts Payable. Let's use $500.00 as the value of the merchandise bought, and $50.00 worth of supplies, also on credit. Debt Supplies and credit Accounts Payable.

TABLE A

(1)	Debit Bank	$3,000.00	
	Credit Capital Account		$3,000.00
	Recording your capital contribution.		
(2)	Debit Rent	50.00	
	Credit Bank		50.00
	One month's rent paid in advance.		
(3)	Debit Machinery	1,000.00	
	Credit Bank		200.00
	Credit Notes Payable		800.00
	Purchase of Machinery for cash and notes.		
(4)	Debit Materials	500.00	
	Credit Accounts Payable		500.00
	Purchase of Materials on Credit.		
(5)	Debit Supplies	50.00	
	Credit Accounts Payable		50.00
	Supplies Purchased on Credit.		

Your men are paid at the end of each week. How about that journal entry? It is treated as an entry when you pay your men. Their time is accumulated on time cards or a time book—day by day—for the week, in such manner as to permit you to charge the customer.

Let us pause here and see where your money has traveled. Of course you will realize that we would have had many more transactions than have been considered, but there are enough to illustrate the working of the books. First I shall make up the journal entries in the conventional form: (*Table A*)

From our journal we are to post these transactions to the ledger accounts affected. You will note I have numbered these journal entries, for purpose of reference. Let us now take up the accounts as they arise in the journal and post them: (*Table B*)

These transactions having been posted to the proper ledger accounts, we can then take off a trial balance. A trial balance is a trial list to prove the correctness of the ledger balances. Remember, please, that a transaction records the moving of value from one place, or account, to another, resulting in debiting the disposition and crediting the source. It naturally follows that if each entry balances—the debit equals the credit—any number of entries will balance when put together. Our trial balance shows: (*Table C*)

(*Continued on page* 48)

TABLE B

Bank Entry No. 1 shows a debit of	$3,000.00	
Entry No. 2 shows a credit of		50.00
Entry No. 3 shows a credit of		200.00
We have a debit of $3,000.00 and two credits totalling $250.00. Subtracting we find we have $2,750.00 debit balance.		
Capital Account: Entry No. 1 shows a credit of		$3,000.00
Rent: Entry No. 2 shows a debit of	50.00	
Machinery: Entry No. 3 shows a debit of	1,000.00	
Notes Payable: Entry No. 3 shows a credit of		800.00
Materials: Entry No. 4 shows a debit of	500.00	
Accounts Payable: Entry No. 4 shows a credit of		500.00
Entry No. 5 shows a credit of		50.00
A total credit of		$ 550.00
Supplies: Entry No. 5 shows a debit of	$ 50.00	

TABLE C

	Debit Balances	Credit Balances
Bank	$2,750.00	.....
Capital Account	.....	$3,000.00
Rent	50.00	.....
Machinery	1,000.00	.....
Notes Payable	.....	800.00
Materials	500.00	.....
Accounts Payable	.....	550.00
Supplies	50.00	.....
	$4,350.00	$4,350.00

Intersection of Two Pipes of Same Diameter and Angle of 45°

THE necessity for a pattern for two pipes of the same diameter intersecting on an angle, is common to the heating and ventilating mechanic. The accompanying illustration shows such a problem. These pipes are joined on an angle of 45 degress.

First draw the plan *M* on center line a-b. Next draw the vertical pipe *O*. Through a point midway between c-d draw the center line of R an indefinite length at a 45° angle. On this line draw profile N equal in diameter to plan M. Divide these circles into spaces and number them as shown. It is not necessary that there be any definite number of divisions, but the important thing is that each quarter be divided into the same number in each of the two circles. Perpendicular lines are drawn from these points in M as shown, and lines from the points in profile N are drawn parallel to the center line of R, intersecting the perpendicular lines drawn from points in M. Next draw the line of intersection of the two pipes through the points just located by the intersection of the two groups of lines M and N.

L. F. Hyatt, Instructor, Sheet Metal Department, McKinley High School, Canton, Ohio, is the author of this article. He is a graduate of Kent state college.

Mr. Hyatt has spent 13 years in the industry.

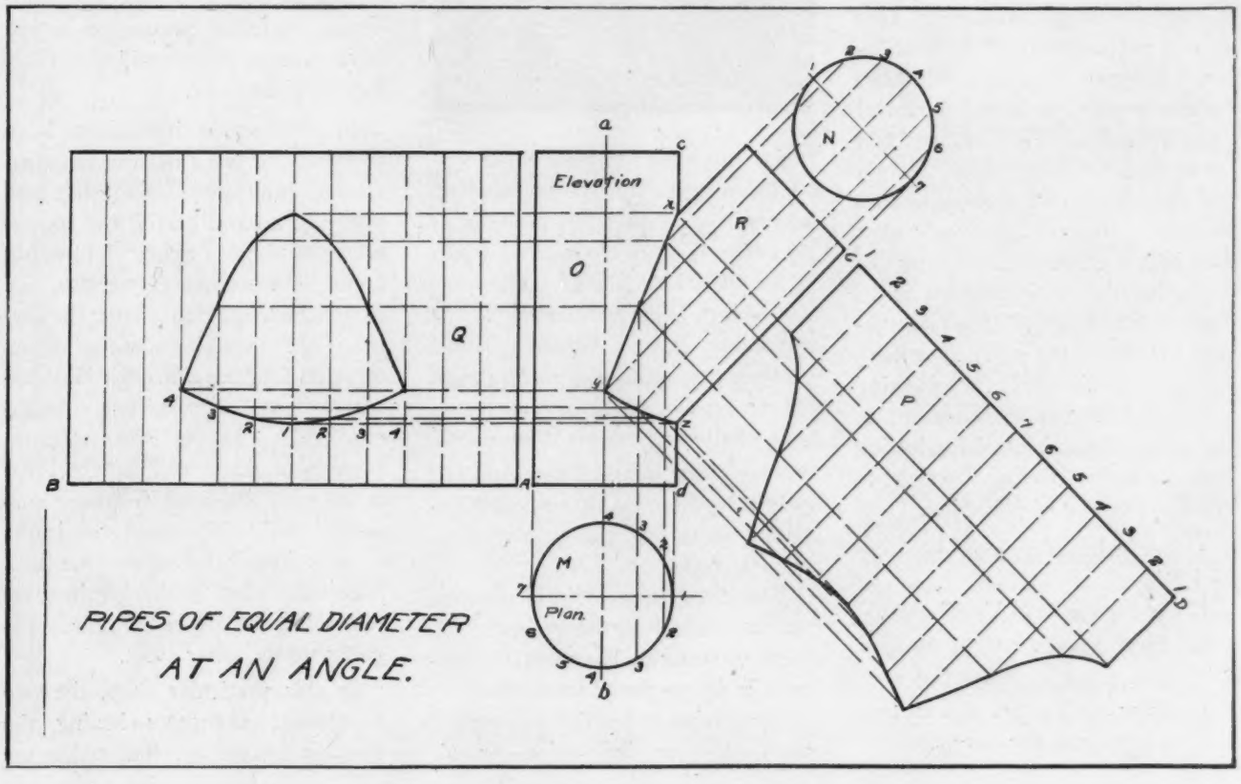
He has been teaching for 13 years.

Mr. Hyatt also conducts the vocational courses for men employed in the industry.

We may now proceed with the development of the pattern. First draw the stretchout line A-B, and on this line step off the 12 spaces equal to the spaces in plan M. These spaces on line A-B give the length of the circumference of pipe O. Next draw the horizontal line from the top of the pipe O. Now draw perpendicular lines from each point on the stretchout line, intersecting the horizontal line just drawn. Then from each point on the line of intersection x-y-z draw horizontal lines intersecting the lines 1, 2, 3, 4, etc., as shown in Q, and draw the line through these points, describing the opening into which the pipe R will fit. This completes the pattern for vertical pipe O.

To develop the pattern for R the stretchout line C-D is drawn, of indefinite length, at right angles to the center line of pipe R. On this line step off the 12 spaces equal in length to the spaces stepped off on profile N. Draw lines from each

(*Continued on page* 48)



MECHANICAL CIRCULATION

An Article on How to Figure a Heating Job for Small Industrial Plant

By Fred Bishop

THE subject assigned to me covers a pretty broad field and might refer to heating, ventilating, or transmission. In giving me this subject, I find that the association officers intend that I should give to the convention anything that might be of value in the heating or ventilating line, and, I have therefore decided to heat a small factory 40 x 60 x 12 with a furnace and fan, making it as simple as possible. In presenting this, I will dwell on five important details that enter into the design of such a plant for uniform satisfactory heating and which is the cheapest to install and most satisfactory in heating results and economy. This plan is patterned after an installation I designed about four years ago for the Royal Oak Tool Co., Royal Oak, Michigan. This job was laid out to heat the factory to 60 degrees and the office to 70 degrees in zero weather. It developed later that they had no trouble in heating the entire building to 70 degrees at 15 degrees below zero. It was necessary for one of the men to get there only twenty minutes before working hours to bring the temperature to the right point, a banked fire having been maintained during the night to prevent freezing of plumbing.

The five points I want to dwell on are:

1. Infiltration or Air Change.
2. Heat Losses.
3. Furnace Capacity.
4. Cubic Feet Air per minute required and Fan Size.
5. Duct and Opening Sizes.

Referring to plan of the building, you will note that the building is 40 x 60 x 12 in one corner of which is the office 12 x 12 x 12. The walls are 13 inch brick not plastered. The windows have Fenestra steel frames, the large ones having tight fitting ventilators for summer use. The small windows are double sash.

The ceiling is lathed and plastered only and there is an air space between the ceiling and roof of three or four feet.

The floor is four inch concrete on cinders laid on the ground.

There being no basement, the furnace is set on the concrete floor.

In arriving at heat losses we must also add for infiltration or air change, because for every cubic foot of air that leaks into a building, a like amount leaks out on the opposite side from the direction of the wind and this new air must be heated from outside temperature to the temperature of the room.

It is customary in the average house job to figure from one to two changes of air per hour from infiltration depending on exposures and window openings, and this usually averages up a house pretty well, but the correct method for accuracy especially in a factory with large cubic contents in proportion to exposures is to arrive at the actual infiltration. It will surprise you how this infiltration varies in proportion to the cubic contents as you will note from figures given later.

In arriving at infiltration in a room having one exposure we must assume infiltration from that one side. In a room having two exposures, we must figure infiltration from both exposures because the wind sometimes comes from the corner. However, in a room having three or four exposures, it is necessary to figure only the two continuous sides having the greatest amount of doors and windows because with the wind from the corner of these two exposures is the greatest infiltration at any one time. When the wind is blowing in these two sides, the air in the building is going up the other sides.

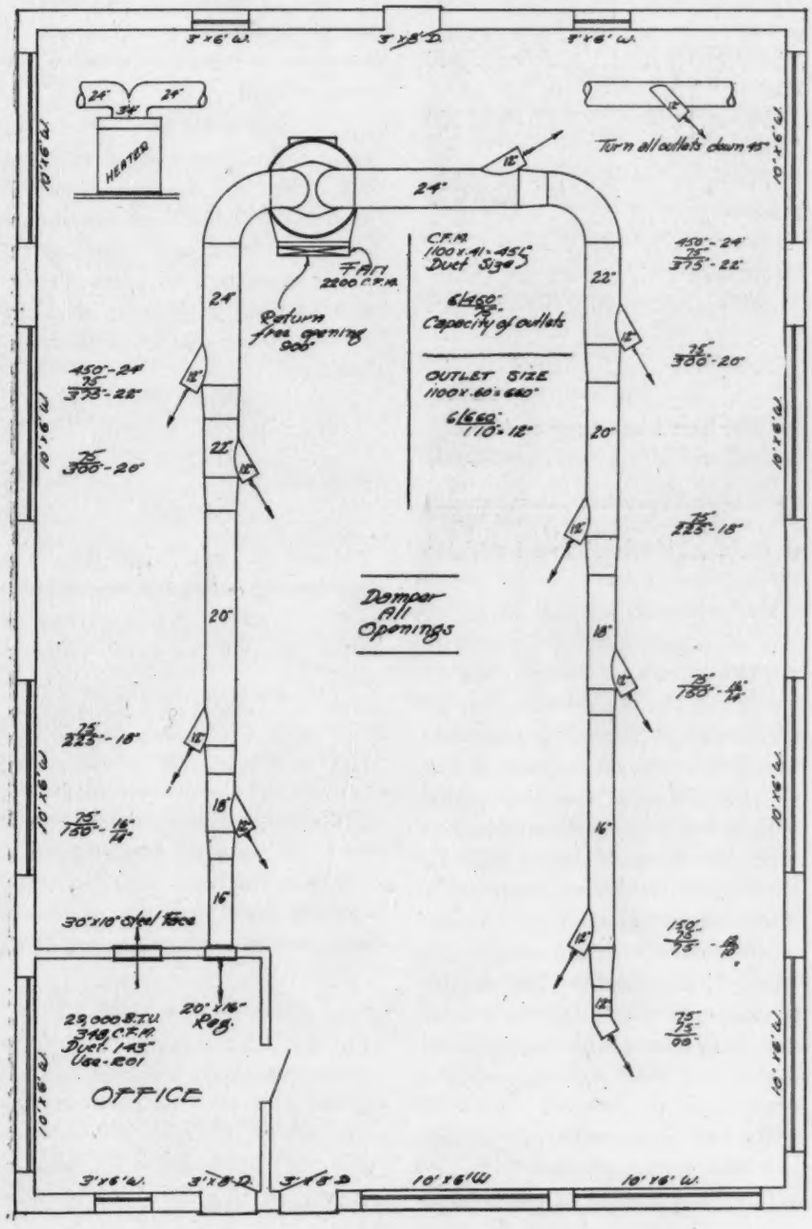
In this particular shop, the two continuous exposures having the greatest amount of infiltration are

south and east, and in figuring infiltration, we take into account openings only on these two sides. When the wind is from any direction aside from southeast, the infiltration is less and our factor of safety is therefore right when we base our calculations on the maximum. Table "A" gives the cubic feet of air per hour per lineal foot of window or door crackage that will come through such openings under average conditions with a 15 mile per hour wind. These figures are used by the Heating and Piping Contractors' Association in calculating hot water or steam radiation and are the same naturally for warm air. For example, the majority of the windows in this building are 10 ft. by 6 ft. steel frame. The distance around this window is 32 ft. The distance around the 3 ft. by 8 ft. door is 22 ft. The double sash windows 3 ft. by 6 ft. have an extra 3 ft. crackage across the center, making the total crackage 21 ft.

TABLE "A"

Infiltration in Cubic Feet Per Lineal Foot of Crackage

	Cu. ft.
Stationary wood sash.....	25
Double hung wood sash.....	50
Double hung steel sash.....	100
Casement windows	100
Fenestra windows	100
French doors	100
Outside doors	200
Outside doors with storm doors	100
Storm sash—reduce 50%	
Outside doors with inner vestibule door	100
Metal weather strips—deduct	50%



In addition to leakage around doors and windows, we have to take into account the leakage through the south and east brick walls. This leakage, from information just issued by the A. S. H. & V. Engineers is 7½ cubic feet air per hour per square foot of brick walls 13 inches thick.

We will not take into account leakage through ceiling because in a job of this kind it is slightly due to the fact that the downward pressure of the air from the warm air ducts rather neutralizes any effect from this source.

Table "B" tabulates the infiltration from the shop and Table "C" gives the same for the office.

TABLE "B"

Infiltration From the Shop

Windows—

6 by 10 = 32 ft. perimeter × 6 windows = 192 lineal ft.

Door—

3 by 8 = 22 ft. perimeter = 22 lineal ft.

Walls—

	Sq. ft.
60 plus 28 = 88 × 12 =	1,056
Less windows and doors	384
	672

192 × 100 = 19,200 cu. ft. air
22 × 200 = 4,400 cu. ft. air
672 × 7½ = 5,040 cu. ft. air

Total infiltration 28,640
Cubic contents = 27,072 cu. ft.

One point I want to stress as I said at the start is the difference in infiltration as compared to cubic contents between the shop and the office. The shop has a cubic content of 27,072 cu. ft. The infiltration is 28,640 or just a trifle over one change of air per hour. The cubic content of the office is 1,728

cubic feet while the infiltration is 11,095 or six changes of air per hour.

You will see that had a thumb rule been used for the office it would have fallen short. As it is, this room is as cozy as a parlor.

Had this building been all one room, we would have figured infiltration only on the south and east, but on account of the office facing only on the south and west, we had to figure a southwest wind for this room, and, consequently, the entire building as two rooms figures a factor of safety more than for one room only to the extent of the window and wall on the west side of the office.

Had this building been divided into four equal rooms, we would have had to figure infiltration on two walls and windows for each room to provide for a possible corner wind against any one room. In this case, you will see that the requirements for the entire building for infiltration would have been more, although the furnace capacity would not necessarily have been more because the wind would never blow from four directions at one time.

We are now ready to figure the heat loss for each room and the total of each. This is shown by Table "D".

You will note for the ceiling we have a temperature difference of only 30 degrees in the shop and 35 degrees in the office because in an attic under ordinary constructions, it is about one-half as cold as the difference between the temperature of the room below and outdoors.

For the floor we figure only 20 degrees because there is usually a difference of 20 degrees between the temperature of the room at the floor and the concrete floor on the ground. Omitting this is the reason why many rooms with floors on the ground fall short of heat requirements.

The heat losses could just as well have been figured on Standard Code factors but adjustments would have been necessary for the different temperatures we have shown and it would have been a longer process. Dividing by 800 and adding three cyphers, dividing by 12 and adding three cyphers, etc., etc., gives B.t.u.'s at 70 degrees. To change to 60 degrees, deduct 1/7 or approximately 15 per cent.

Total heat loss is 180,925 B.t.u. Inasmuch as the furnace and the piping are in the rooms to be heated, nothing need necessarily be added for piping loss, but inasmuch as it is always possible that the furnace location may at a later date be partitioned off into a separate room, it is advisable to add 10 per cent for furnace capacity, making a total of 199,017. This also gives factor of safety in case of poorer grade of coal used, or furnace not thoroughly clean, or both.

Furnace Size:

Grate area must be arrived at first. Standard Code Formula is based on 7½ lbs. coal per square foot grate per hour. With fan resulting in adding 75 degrees to every cubic foot air, we have an efficiency of about 70 per cent. On this basis, we have—

$7\frac{1}{2} \times 12{,}000 \times .70 = 63{,}000$ B.t.u. per sq. ft. grate.

$$\text{Grate area} = \frac{199{,}017 \times 144}{63{,}000 \quad 1} = 455 \text{ sq. in.}$$

Above is grate area providing ratio heating surface to grate is 20 to 1. If more or less, deduct or add 2 per cent for every point in ratio.

If 19 = 455 × 1.02 = 464 sq. in.
If 17 = 455 × 1.06 = 482 sq. in.
If 21 = 455 × .98 = 446 sq. in.

Above is based on return air.

To change the square inch Standard Code rating of any furnace to B.t.u.'s on fan basis, multiply rating in inches by 231.

Cubic feet air per minute = C.F.M.

$$\text{C.F.M.} = \frac{H \quad 55}{(T^1 - T^2)\ 60} = H.012$$

H = B.t.u. = 181,000
T^1 = temperature air entering room = 135°
T^2 = temperature air leaving room = 60°
$T^1 - T^2$ = 75°

TABLE "C"

Infiltration From the Office

Windows—
One 6 by 10 = 32 ft. perimeter
One 2-sash window 3 by 6
3 plus 3 plus 3 plus 6 plus 6 = 21 ft. crackage
Door—
3 by 8 = 22 ft. perimeter
Brick wall—
(12 plus 12) × 12 = 288 sq. ft.
Less windows and door 102 sq. ft.

186 sq. ft.
32 × 100 = 3,200
21 × 100 = 2,100
22 × 200 = 4,400
186 × 7½ = 1,395

11,095 cu. ft.
Cubic contents 1,728 cu. ft.

TABLE "D"

Heat Loss From Shop

	B.t.u.
Infiltration—	
28,640 cu. ft. × .018 × 60 =	30,931
Glass—	
624 sq. ft. × 1.1 × 60 =	41,160
13-inch brick wall—	
1,488 sq. ft. × .27 × 60 =	24,120
Ceiling—	
2,256 sq. ft. × .60 × 30 =	40,620
Floor—	
2,256 sq. ft. × .31 × 20 =	14,000
Total heat loss from shop	150,831

Heat Loss From Office

	B.t.u.
Infiltration—	
11,095 cu. ft. × .018 × 70 =	13,980
Glass—	
102 sq. ft. × 1.1 × 70 =	7,840
Wall—	
186 sq. ft. × .27 × 70 =	3,500
Ceiling—	
144 sq. ft. × .60 × 35 =	3,010
Floor—	
144 sq. ft. × .31 × 20 =	900
Inside wall—	
288 sq. ft. × .30 × 10 =	864
Total heat loss for office	30,094
Total heat loss—shop and office	180,925

60 — change hours to minutes

$$\frac{H\ 55}{75 \times 60} = H.012$$

C.F.M. = 181,000 × .012 = 2,172

Fan must deliver 2,172 C.F.M. against resistance in furnace and piping.

Duct Sizes:

Table "E" shows how duet sizes are arrived at depending on velocity through ducts. The smaller the duct and the higher the velocity, the greater is the friction. In laying out the piping shown on plan a velocity in the ducts was figured at 350 because there is plenty room for this size piping and it results in piping the furnace equal to its gravity rating which reduces probability of burning up the furnace when fan is not in use. In addition to this, this velocity reduces friction to a minimum. Branch openings are increased in size to reduce velocity entering room to 250 feet per minute.

TABLE "E"

Duct Size

$$\text{Duct size} = \frac{\text{C.F.M.} \times 144}{\text{Velocity}}$$

$$400' \text{ velocity duct} = \frac{\text{C.F.M.} \times 144}{400} = \text{C.F.M.} \times .36$$

$$550' \text{ velocity} = \frac{\text{C.F.M.} \times 144}{350} = \text{C.F.M.} \times .41$$

$$300' \text{ velocity} = \frac{\text{C.F.M.} \times 144}{300} = \text{C.F.M.} \times .48$$

C.F.M. = 2,200

Duct size—400′ = 2,220 × .36 = 792 sq. in. area

Duct size—350′ = 2,200 × .41 = 902 sq. in. area

Duct size—300′ = 2,200 × .48 = 1,056 sq. in. area

Outlets—

250′ velocity = C.F.M. × .60

Piping starts with a 34 inch from furnace, divided by a "Y" into 2 24 inch pipes and reduced as openings are taken off with some excess at ends. On east side we take off six openings which divided into 452 inches equal 75 inches for each opening. Increase these to reduce velocity, gives 6 12 inch openings. The same relation exists on opposite side excepting that the office had to be taken into consideration first and then the balance divided into four openings. In the office a 16 inch pipe is used although it figured a 14 inch, because it is on the end of the line in an enclosed room while the balance of the job is in the open. This is just a safeguard from a standpoint of pressures, and also provides for heating the office to 70° while the factory is 60°.

Ducts are as close to ceiling as possible and branches are taken off at a 45 degree angle downward, eliminating necessity of using angles or elbows. All openings should have dampers to allow for regulation.

Return air face is placed at floor level between office and shop relieving office of return air through pressure on warm air side.

All return air to furnace is taken directly from rear of furnace through fan.

What Is Relative Humidity?

There is a lot of discussion these days about relative humidity. In fact, some of our furnace dealers use the term as glibly as any flapper speaks about dates.

The term is, seriously, one which every furnace installer ought to be familiar enough with to explain to the customer who doesn't know a firepot from a carburetor. Here is a good explanation we picked out of scientific literature:

Consider a cubic foot of air, at room temperature, as if it were a cubic foot of ice. Put this cubic foot of air into storage and lower its temperature down to zero F. Endeavor to put moisture into this air and it is at once evident that no moisture can be added. All the moisture which the cubic foot of air will hold is 0.472 grains.

Raise the temperature of the cubic foot of air to 70 F. Enough moisture can now be added to bring the total content up to 8.069 grains. This is 16 times as much as the same cubic foot of air held at zero.

As a saturated condition existed at zero, the relative humidity, was 100 per cent. Also, at 70 F., with 7.597 additional grains of moisture, the cubic foot of air was saturated and had a relative humidity of 100 per cent. In other words, under each tempertaure condition the cubic foot of air was holding all the moisture it could possibly hold.

If at zero F. this air held only 0.236 grains of moisture, the relative humidity would have been only 50 per cent. Furthermore, at a temperature of 70 F. a moisture content of 4.0345 grains would have also represented 50 per cent.

It is, therefore, apparent from the examples given that the relative humidity of air is decreased when the air is warmed and increased when the air is cooled. Thus, if a cubic foot of saturated air is heated from zero to 70 F., its relative humidity would have changed from 100 per cent to:

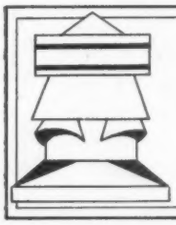
$$\frac{0.472}{8.069} = .58 \text{ or } \frac{58}{100} \text{ per cent}$$

Relative humidity, it is evident, takes into account not only the temperature of the air but also its absolute moisture content.

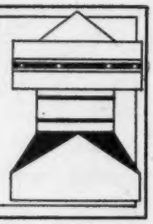
Nevertheless, when human beings or manufactured products are considered, the effect of the moisture in air is always noted in terms of relative humidity rather than absolute humidity or absolute moisture content.

The reason for this is that human beings, animals and birds, many manufactured products and many materials may be said to feel the dryness or dampness of the air due to hygroscopic conditions of the skin or of the exposed surfaces. This feeling of dryness or dampness.

(*Continued on page* 44)



GRAVITY EXHAUST VENTILATION



A Formula for Ventilator Sizes

NATURAL ventilation by means of mechanical ventilating heads on the top of a duct system or opening directly into a room is widely used in all branches of industry and in barns, houses and institutions.

So far as the ventilator heads are concerned, they were used first as a means of keeping rain, snow and storm out of the ventilator stack or opening. We now know that they aid in eliminating back draft and increase the efficiency of the ventilator.

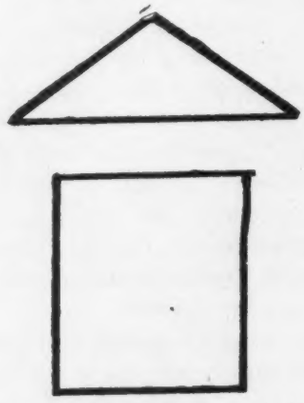
Exhaust ventilation utilizes two separate agencies or principles of air movement—first, the greater bouyancy of inside air caused by a temperature difference between inside and outside air and, second, the energy of the wind.

This explains why in barn ventilation when outside temperature is higher than inside temperature we may find the ventilators reversing their flow and the air moving inward through the ventilator and outward through the lower openings of the structure.

As a general rule ventilators may be divided into two classes—stationary and rotary. Each of these classes may be divided again into two divisions—siphoning and non-siphoning types. The stationary ventilator exhausts through an opening all around the head. The rotary, on the other hand, has a moving head which swings with the wind and the exhausting face is always away from the direction the air is moving.

The siphoning ventilator, of either type, uses the pulling force of the wind as it passes an opening to siphon the inside air out through ventilator.

The performance of any ventilator is governed by several factors. The principle ones are the temperature difference between the inside and outside air, the height of the ventilator head above the inlet openings, the wind velocity, the design,

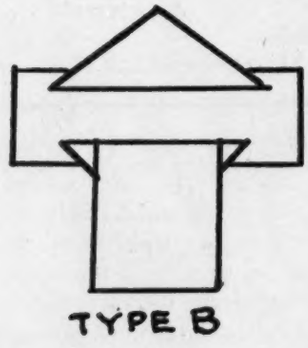


TYPE A

shape and proportion of the ventilator head and stack, the air admission below the head, the resistance of air flow inside the building, the resistance of air flow through the ventilator, and the location of the ventilator with respect to surrounding buildings.

While all these conditions make it difficult for the layman to arrive accurately at the efficiency and capacity of a particular ventilator, it is possible to get a fairly accurate estimation of the ventilator size required to do a certain work. Where the head is the exhausting end of a duct system, it is usually possible to arrive at the ventilator size by estimating the capacities of connecting flues, stacks, etc. In this case the ventilator should equalize in square foot or square inch area the rest of the system. To be on the safe side the ventilator should be just a little larger.

The problem, however, becomes entirely different in open buildings such as shops, factories, foundries, etc., for here large volumes of heated air, smoke, fumes, gases or steam must be handled and the movement of free air within the structure studied. This really requires the services of a ventilating engineer and it is in this class of work which seems so simple, that most of our ventilating troubles arise. In case an engineer is not available, manufacturers' tables of ventilator capacities and tables of air changes required and conditions governing air movements should be



TYPE B

consulted and studied and conditions taken into consideration accordingly.

There is a common rule of thumb formula often used in conjunction with the simpler types of ventilators, that is types other than siphons and rotaries, for determining the size of the ventilators needed. This formula is—

$$\frac{C\ N}{60\ V} = \text{C.F.M.}$$

Where C = the volume of the room in cubic feet

N = the number of changes or air per hour

V = the number of ventilators to be used

60 = the minutes in an hour

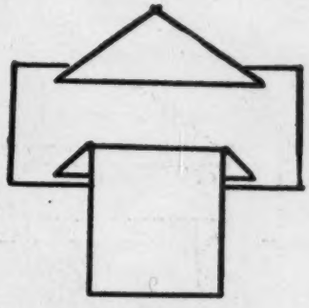
C.F.M. = the cubic feet of air exhausted per minute by each ventilator

Let us illustrate this by taking a typical example. Let us suppose that we are going to ventilate the inside of an open garage which has a ground area 50 feet wide by 80 feet long and is 15 feet high inside. Due to bad air in repair garages it is advisable to change the air inside at least 10 times an hour. Let us assume that we have decided to use 6 ventilators so spaced that their pull is distributed evenly over the floor area of the building.

Substituting for the formula we then have the following—

$$\frac{50 \times 80 \times 15 \times 10}{60 \times 6} = \frac{600{,}000}{360} =$$

1,666 cubic feet per minute required from each ventilator. A mild wind would have a velocity of about 180 feet per minute and since the interior must be ventilated regardless of outside wind conditions, we should assume a low factor of wind velocity.

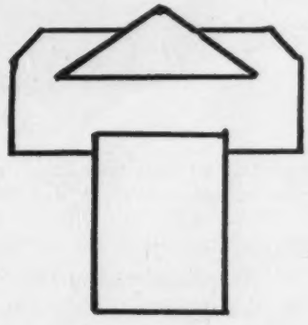


TYPE C

We then have 1,666 divided by 180 equals 9.25 square feet of area or a ventilator with a diameter of 41 inches. Applying the formula we would then need 6 ventilators of 41 inch or the nearest equivalent to make the required number of air changes.

This one example explains why so many ventilator jobs go hay wire, for on this building we are using six ventilators of large size while on an uncalculated installation we probably would find three of smaller capacity.

This formula does not, as we stated, take into consideration ventilators with a higher efficiency or, in other words the rotary and siphon ventilators. This will be taken up in a later installment.



TYPE D

The drawing attached to this article shows outlines of some of the more customary type of ventilators. Type A is the simplest and probably the oldest. It is merely a pipe with an end opening out into the air with an umbrella over the opening to keep out direct rain. In this type the height of the lower edge of the umbrella above the top rim of the stack is usually about ¼ to ½ the diameter of the stack in inches.

Types B, C. D have storm bands around the opening to keep out indirect or wind blown weather. The band also prevents back flow of air and increases the efficiency of the unit considerably. It is well to note the different types of bands and the different kinds of lips over which the air moves into the outside air. These lips and bands are designed to improve air movement inside the band. Each type has its supporters among the manufacturers.

A later article will deal with the problem of using ventilators of greater efficiency.

This formula must not be considered an exact measure of ventilator calculation. It must not be forgotten that some ventilators do have a higher rating than others of duplicate type.

In ordinary ventilation work, say on a farm barn or a small structure where the moving of air is all that is necessary, the sheet metal man can use this formula and if necessary construct his own ventilator.

However, when the moving of smoke, fumes, gases or steam in foundries, shops, etc., is the problem at hand, it is well to use manufactured ventilators which are guaranteed by the maker. This, too, usually makes available the services of the manufacturer's engineering department.

Manufactured ventilators, plus engineering service, are far better than home-made ventilators of uncertain efficiency.

Every ventilating problem can be solved. And every one which is solved puts the ventilating industry just that much ahead. We invite readers to send us short descriptions and layouts of interesting ventilating difficulties they have worked out satisfactorily.

The exterior of the house for which this interesting oil heat installation was designed. The picture was taken during the time the test told about was being run.

Forced Air + Oil = L

Warm air furnace dealers are asked to figure on oil heat installations at frequent intervals. Here's how one job was figured and installed.

IN one of the new home sections of Bloomington, Indiana, there is a house which is attracting a goodly bit of comment both among home owners and among the heating men of the city as well.

It is a modern type house, built of permanent material, using good architecture and high grade materials throughout. Its exterior is of stone and the windows are metal. Its interior is well arranged and artistically decorated.

But the feature which is causing the comment is the heating system.

When the house was first built a few months ago, it had a coal burning furnace. The layout was according to standard code and was put in by a competent furnace dealer. So far as the heating of the house was concerned there were only one or two spots which did not get their share of heat, fuel consumption was low considering the size and construction, and the amount of labor required was no more than expected.

But the owner wanted automatic heat. He decided on oil, since oil is easy to get in Bloomington and compares favorably with good coal in price. In addition to automatic control he wanted to set the furnace somewhat off center in the basement to provide room for some new equipment. And he insisted that he have air change regularly and plenty of heat and freshly warmed air.

The Bloomington Radiator and Sheet Metal Works bid and got the job. They spent some time in looking over the layout and made recommendations which met the owner's favor. They recommended an oil burning furnace with a blower attached to change the air and force the warmed air into all parts of the house.

The arrangement of the house is such that some thought had to be given the heating plant. The house has five rooms and a bath downstairs. The second floor is all in one room which extends entirely over the first floor. This second floor room presented quite a problem, especially for a gravity system and was instrumental in deciding the owner on a forced air system.

The installation selected was a Piatt Forced Warm Air Oil Burning Furnace, manufactured by Motor Wheel Corporation, Lansing, Mich. This furnace is small and compact and fitted in well with the equipment to which the new furnace had to be attached.

The house, while it is faced with stone, has no insulation in the walls so that its coefficients of heat transmission through the walls would be about the same as those of a brick wall or 0.23 B.t.u. per square foot per degree per hour. The attic roof, however, is insulated so that roof heat losses are somewhat less than those of the walls.

The building measures approximately 37 feet by 39 feet in ground area and the contractor figured 14 feet as its height. This brings the cubage to about 20,000 cubic feet. With the fan operating at 375 revolutions per minute on the standard pulley 800 cubic feet per minute are forced through the furnace casing at ⅛ inch static pressure.

In order to get the required air freshness, the system was designed to cause three complete changes of air per hour. Dividing the cubic feet of air by 20 or ⅓ of the 60 minutes in an hour the contractor got 1,000 cubic feet per minute. This necessitated changing the motor pulley to a larger size stepping the capacity up to 1,040 cubic feet per minute or more than the requirement.

The arrangement of the warm air leads is unusual. Four 10-inch leads are taken off the bonnet of the furnace. Within a very short distance one of these 10-inch leads is split into the two 6-inch leads. The other three are divided into two 6-inch leads at varying distances from the

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bonnet. The four original leads therefore become eight leads to the warm air risers. With a gravity system such an arrangement would be out of the question, but with a blower behind the system the air can be forced through all pipes.

The longest run of a warm air lead in the basement is 18 feet. Here again the system departs from good practice in a gravity system. Two of the other leads are almost as long. These long leads were necessary because of the offset of the furnace from the center of the house.

All the cold air returns were taken from within the house, no outside air other than normal infiltration being put into the house. The fan is connected to the cold air pipes and the furnace boot through three leather collars. These provide flexibility necessary to eliminate every possible vibration which might be transmitted to the upper rooms. In addition the blower was bolted down through rubber insulators as a further precaution.

The Piatt Forced Warm Air Oil Burning Furnace as it looks in the basement. Note the split leads from the bonnet and the blower with its cold air pipe.

The two cold air returns are led into the boxes of the fan and so to the furnace. This installation has no cold air lead to the boot bypassing the fan, since in this equipment the fan operates during all the time the burner is going and until the bonnet thermostat shows that the temperature in the bonnet has dropped to a point where gravity circulation will not operate. There is therefore no chance for the furnace to burn out.

The system has worked perfectly since it was installed. A typical test run was made in January when for a period of three days the temperature ranged from 10 degrees below zero to 10 degrees above. In that 72 hour period the temperature of the house was kept at 72 degrees day and night. The temperature did not vary more than two degrees at any time. During that period the amount of oil burned was 40 gallons, which at an estimated cost of 8 cents per gallon would amount to $3.20 or a little more than a dollar a day. There are not many heating plants, regardless of the kind of fuel which can maintain such a temperature day and night during zero weather at lower cost.

An interesting feature of the installation was the speed shown by the dealer's workmen. The men began to dismantle the old furnace at 10 in the morning. At 5 in the evening the oil burner was going and warm air was being blown into the house. One factory man and two workmen from the dealer's force did the work.

Illinois Sheet Metal Men Study Costs at Annual Convention

The Illinois Senatorial Primary election played havoc with the opening day's sessions of the Illinois Sheet Metal Contractors' Association Convention, held April 8, 9 and 10 at the St. Nicholas Hotel, Springfield, Illinois, but in spite of this, the convention opened in the afternoon with a good many of the regulars on hand.

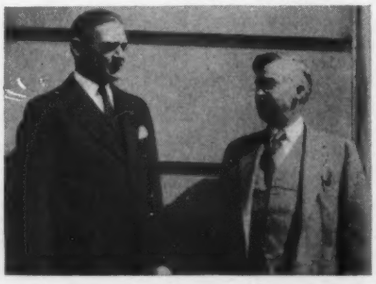
Those who had loyally stayed about the hotel all morning waiting for the convention to open were amply rewarded, however, as the Springfield local provided an excellent luncheon for all the ladies and gentlemen they could round up.

J. C. Neuman, president of the Springfield local, called the convention to order at 2 o'clock. C. M. Crow of the legal department of the City of Springfield welcomed the delegates and visitors to the historic capital city of Illinois, and Joe Walters, president of the state association, made the response.

After various committee appointments J. G. Dingle, C. P. A., of Ottawa, Illinois, gave a very interesting and instructive talk on Overhead and Accounting. Mr. Dingle used concrete cases of shops in bringing out his points and reasons for the various steps necessary to proper bookkeeping. Mr. Dingle's complete talk will appear in a future issue of AMERICAN ARTISAN.

Following Mr. Dingle's talk, Jack Stowell of Aurora, the special representative of the Better Business Committee of the National Warm Air Heating Association, talked on Advertising and Selling for the Warm Air Heating and Sheet Metal Contractor.

Jack said he felt a little uneasy for two reasons; one reason was because he was talking before an audience composed of his own state association members, and another, because his own bookkeeper was in the room. He explained, however, that she was there to hear Mr. Dingle talk, and not to listen to him.



Ed. Daugherty and Max Baugh

Jack Stowell said he uses Mr. Dingle's services himself and realizes very keenly the needs of all sheet metal contractors and furnace men for correct cost-finding systems.

The National Association, said Jack, has been mainly interested in promoting and advocating better warm air heating installation, but this year his talks to the various state conventions throughout the country have been confined to selling and advertising, because it is merchandising methods that the average sheet metal and furnace man needs most of all.

Most of us, said Jack, know how to do a good job of installing a warm air heating system, know how to fabricate and erect practically any kind of sheet metal work and, sooner or later, learn how to make a profit out of our business—or soon go broke, but when it comes to advertising and selling most of us know little or nothing about how to go about it.

"For some reason or other we in the sheet metal and warm air heating business feel that we are the only ones in retail business that do not need to do systematic advertising and selling," he stated, and asked if anyone knew why this was so.

Jack proceeded to prove that advertising influenced our daily life—that it was practically impossible for us to live without its influence and cited instance after instance of why this was true.

Jack painted a mighty rosy future for the warm air heating industry provided the dealer wakes up to the fact that he must sell the

F. J. Eberling, W. A. Meck, Ed Fierek and Harry Jones
C. L. Snelson, George Harms, Rudy Jobst and Frank Eynatten

Jules Gerock, Herb Symonds, O. Voorhees, F. S. Gottschalk, Joe Farris, G. E. Hawthorne and H. J. Somers

warm air heating idea to the public.

Jack not only talked but had with him various charts which he used to outline how any dealer might plan a workable sales and advertising campaign. He also had charts to show just what a newspaper advertisement should contain and told why. Many of the boys in the room were taking down notes and if the members of the association don't advertise in their local newspapers after hearing Jack Stowell's talk it won't be because he didn't put it across.

It is unusual for a convention to have any semblance of a business session in the evening and many wise boys thought that mighty few, if any, men would be on hand to view the Armco moving picture, "Continuous Rolling of Steel Sheets," which was shown Tuesday evening. However, J. P. Butterfield of the American Rolling Mill Co., who explained the various mill operations while the film was being shown, had a good sized audience. Many men lingered after the picture was run off to ask questions.

Wednesday morning the convention was honored by the presence of J. E. Merrick of Louisville, Ky., President of the National Association of Sheet Metal Contractors, who gave a talk on Sound Business Practices for Sheet Metal Contractors. This talk was published in the March 29th issue of AMERICAN ARTISAN.

The rest of the morning session and most of the afternoon meeting was devoted to a study of costs and prices on the various kinds of sheet metal work. This meeting was in charge of Fred S. Bremer of Chicago. The previous day the men had been given the following sample job to figure:

100 ft. gutter lining (in wood) 3 foot girth.

100 foot 4 inch square downspout.

8 4-inch square elbows.

1 10 by 12 foot roof (no flashing).

60 foot valley, 1 foot 6 inch girth.

2 chimney 1 foot 6 inch by 4 feet, saddles and flashed.

50 foot plain ridge roll, 1 foot 3 inch girth.

All of the above to be No. 26 galvanized steel.

What do you pay your men per hour? .....

Charge made per hour for labor (including overhead and profit) on time and material work.....

Signed .....

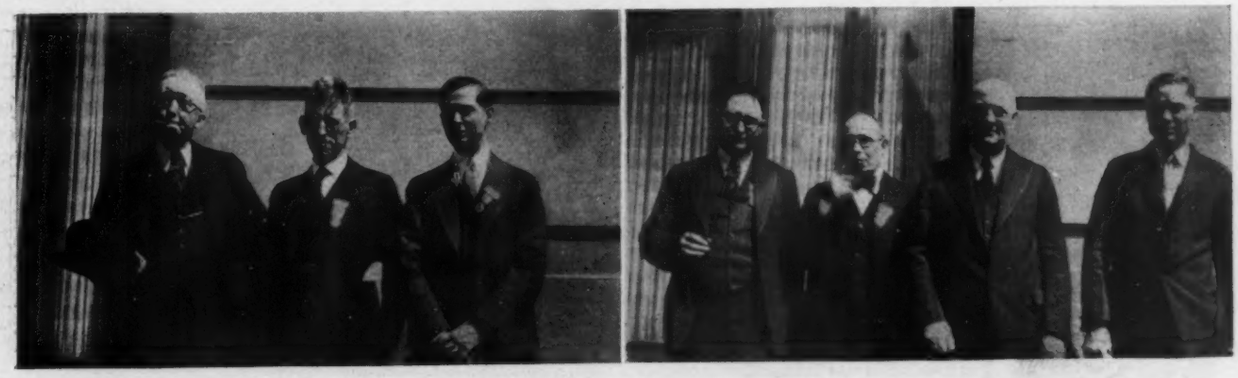
City .....

Will you please figure out your selling price for above job, and turn in this sheet at noon Wednesday or before?

Wednesday afternoon the following tabulations were put on the blackboard where all could see them:

City	Charge for job	Rate paid men	Charge made per hour
Champaign..	$170.20	$1.12½	$1.75
Pekin	176.20	1.00	1.50
	164.40	1.10	1.60
Ottawa	238.00	1.17½	1.75
Peru	280.00	1.17½	1.60
	170.00	....	....
Peoria	192.00	1.00	1.50
	208.50	....	....
Canton	175.48	.85	1.35
Springfield..	200.80	1.25	2.00
Chicago	268.50	1.56¼	2.65
Louisville...	192.50	1.10	2.00

Wednesday evening the con-



C. Williams, J. E. Merrick, W. R. Weil, A. L. Mayers, Augie Hardten, John Ditchett and Bill Bertelsen

vention delegates, their ladies and friends, were guests at the annual banquet and entertainment given by the Travelers' Auxiliary.

An unusually fine orchestra, paper caps and hundreds of gay balloons put everybody in a holiday mood. While the splendid meal was being brought in the Auxiliary president, A. P. Hahn, introduced all the well known celebrities.

The festivities then were placed in charge of William Price Laffin of Peoria, who acted as toastmaster in his usual capable and entertaining manner.

The boys pulled a fast one on Jack Barclay by having Anne Nielsen, an entertainer, make the dramatic entrance of rushing up to Jack and claiming him as her husband. She pleaded with the crowd for justice, claiming Jack had married her in South America, later deserting her and their seven children.

The surprise feature of the evening, however, was a four round boxing exhibition which everybody, including many of the ladies, enjoyed very much.

Dancing was next on the program and until 12 o'clock most of the folks preferred to dance rather than play bridge for which tables, cards and prizes were also furnished.

Thursday morning, George Harms, chairman of the Trade Development Committee of the National Association, spoke on Trade Development.

Excerpts from his talk follow:

Trade Development

What is it? As it pertains to sheet metal work it means creating work that does not come to you in the regular course of business, and that you have done something to of work which has not been used create this work. This does not signify that it must be a *new* class before, although this should not be overlooked, but there is a great amount of business that can be had through advertising or personal solicitation if you go after it.

Therefore, if through your efforts the old, wornout gutters and downspouts of a house are replaced with new work, you have in reality created that job. If through your efforts you have replaced a wood shingle roof with sheet metal, slate or tile, you have really developed just so much business.

Trade Development is often very much misunderstood. Many believe that it applies only to scientific research and producing something that has not been in use before. This is a mistake; it is really up to you to use your brain, your time and your efforts to create and develop both old and new business.

In 1915 the president of the National Association of Sheet Metal Contractors conceived the idea that a committee should be appointed for the purpose of developing sheet metal business. I, at that time, was appointed chairman. I was not, however, told what I was really to do, and as usual the committee did not function immediately. Then came the World War, and development of business was not required as we all had more than we could take care of. However, there were committee meetings, and it was decided to issue a book showing many different classes of sheet metal work, believing that this would be the proper means of developing the business along correct lines, as up to that time nothing was published covering sheet metal construction.

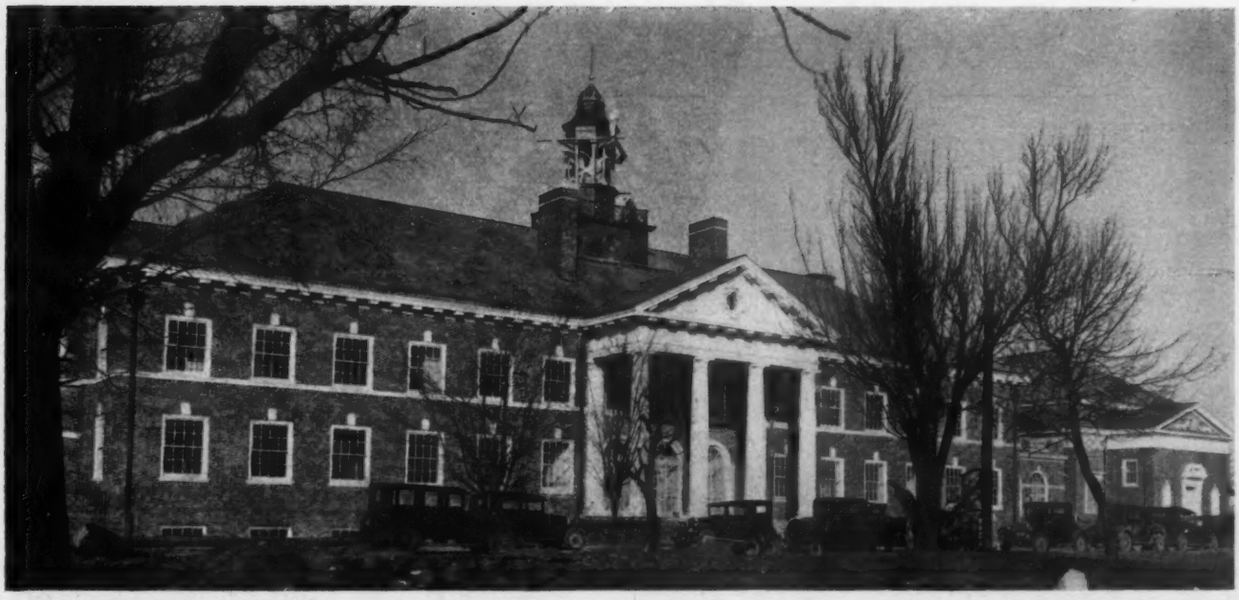
Both architects and sheet metal contractors were doing work in accordance with their own notions. Much of this was considered high grade, but a great deal of it was shoddy.

It was about 1920 when the committee met in Indianapolis, with Paul Brandstedt chairman of the committee. The probable cost of a book was considered, and it was stated offhand, without going into any details, that it will probably cost $50,000 to complete the work. This, however, was only guess work. The association had at that time some money in the treasury, and this was to be used to start the work. The different members of the committee ventured to loan the association $1,000 or $2,000 each to put the matter over.

Mr. Brandstedt went to work very vigorously, and, as is often the case, as chairman of the committee, he tried to do all the work, going so far as to take care of the drawings himself, and to do all the clerical as well as the financial part of the committee. As is also the usual case, the other members of the committee appeared to be very well satisfied to let Paul do the work, with the final result that it was entirely too

(*Continued on page* 45)

Bill Laffin, Jack Barclay, Mat Friedman, Tom Pearson, Wm. J. Franz and Jim Barrett



A True Colonial Cupola Formed In Copper

IT IS one of the accepted theorems of architecture that the decorative features of a building can make or break the artistic effect. The proper proportion and placement of simple ornamentation, so that it puts the finishing touch to the general effect and satisfies the demand for completeness without creating a feeling of redundance makes good architecture.

The Mary Institute, a finishing school under the auspices of Washington University, is now housed in its new building in St. Louis County. Study and Farrar, architects, of St. Louis, are responsible for the design of the building. The copper cupola which surmounts the central section of the roof immediately above the entrance-way, and which adds the finishing touch to the faultless architecture, was made and erected by the Huber-Richardson Sheet Metal Works, also of St. Louis.

Originally, the specifications for the cupola were written to require the use of wood. Belfries and steeples have long been parts of school buildings, at one time serving as protection for the bells that summon the students from the fields. In Colonial architecture these were made of wood, and strict adherence to tradition demands that design be in accordance with those of the past. An inspection of similar cupolas throughout the country showed, however, that many were being replaced by metal because of the fire hazard and the possibility of lightning damage. The maintenance of wood towers, too, is a considerable item, so that if permanence is at all desirable, it is advisable to replace the wooden construction with something more durable.

For these reasons, the specifications demanding wood for the cupola on the Mary Institute were changed to require the use of copper. This metal is permanent, and if adequately connected to the ground, affords that conductivity which will take care of any lightning charge that might be deposited.

This change in specification necessitated the re-taking of bids. New drawings were made up showing the metal formed to give the appearance of wood. The final result of quotations showed that the sheet copper

(*Continued on page* 44)

Development of End Boot For Furnace Connection

THE development of an end boot for warm air furnace connection is shown by the drawing. This type of end boot is shown by the three views, that is, the top, side and end view. The center line of the rectangular opening and the center line of the round opening are not symmetrical.

This fitting is used often where there are obstructions such as walls, floor joist, etc. The drawing is laid out in proportions of 10 inch pipe and a 7 by 12 inch rectangular opening. It is developed by three views as shown on the drawing. On the end view the circular opening is divided into a number of equal parts. In this particular case sixteen. This fitting is developed by triangulation.

Ordinarily seams are made at the shortest portion of the development although in this particular case it is felt that the best place for the seam would be on the line A1.

W. R. Haines, Marshalltown, Iowa, is the author of this article.

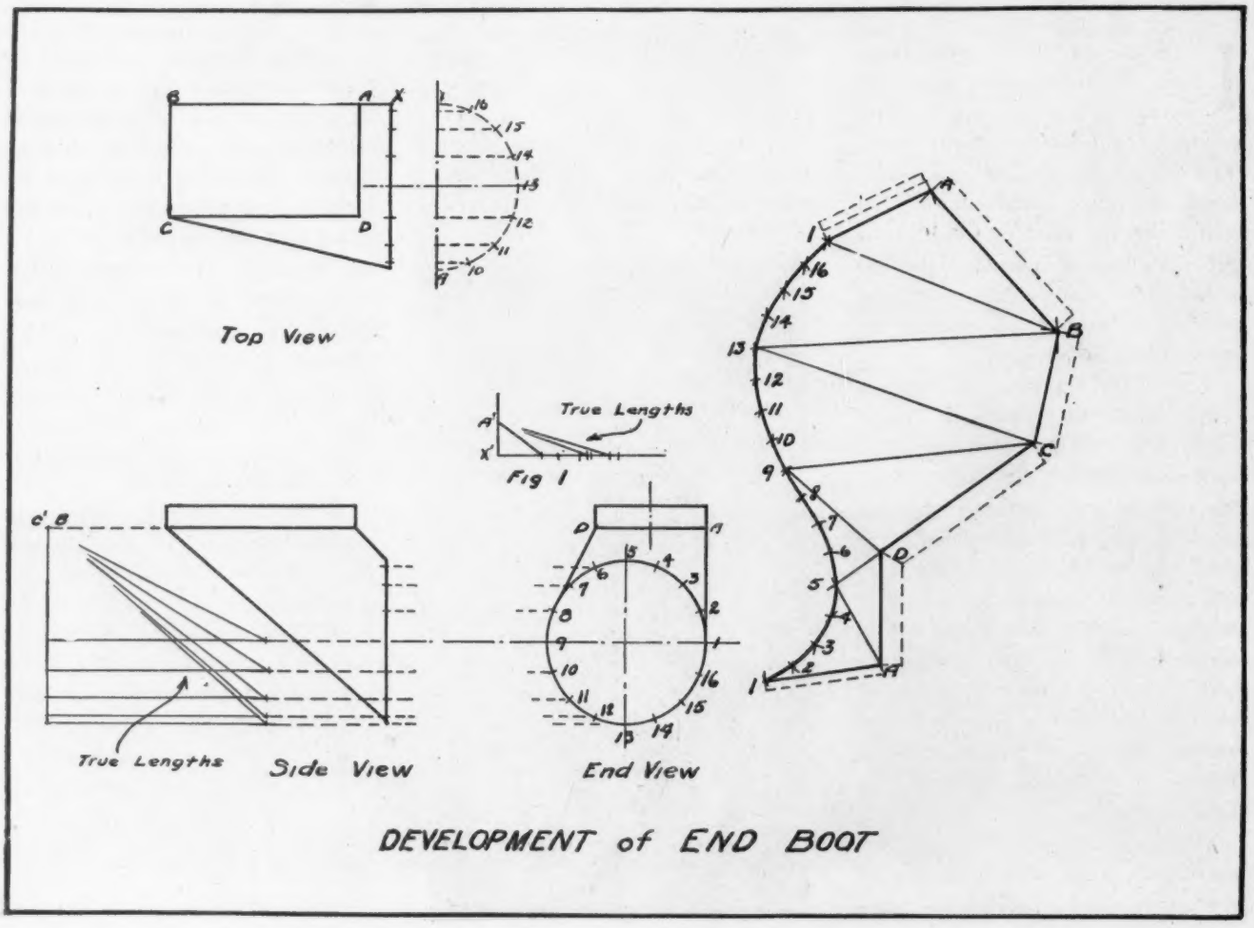
For six years Mr. Haines was Instructor in Sheet Metal, Department of Mechanical Engineering, Iowa State College, Ames, Iowa.

He has been in the industry 26 years.

At present he is doing shop and experimental work in Marshalltown.

To start the development line AD is laid off and point 5 is then located. In order to get the true lengths of points from A1, A2, A3, A4, A5, also D5, D6, D7, D8, and D9, Figure 1 is used.

On the top view we have shown AX. This represents the distance from the vertical plane of the face of the round opening and the vertical plane of the line AD, therefore, this distance would be laid off to form one side of the triangle. This distance is the same for all of the points from 1 to 9 then it is only necessary to lay out on the base of the line the distances taken from end view A1, A2, A3, A4, A5, etc., and the true length is represented by the hypotenuse of the triangle made up using A prime, X prime, as one



side and the distance taken from the end view A1, A2, etc., as the other side.

As stated before, the first point to locate would be point 5. The true length of A5 is taken from Figure 1 and using point A as the center an arc equal to the true length of A5 is circumscribed then the true length of line AD is taken from Figure 1 and using D as the center we circumscribe an arc which will intersect the arc A5 which locates point 5.

Point 4 is located by circumscribing an arc from point A using the true length A4 taken from Figure 1 and then from point 5 circumscribe an arc equal to the distance between the points 4 and 5 on the end view and the intersection of these two arcs locate point 4.

Point 3 is located in the same manner exactly as point 4. Also points 2 and 1 which completes triangle A-5-1.

Point 6 is located by circumscribing an arc from point D equal to the true length D6 taken from Figure 1 and then from point A circumscribe another arc equal to the distance between points 5 and 6 which will locate point 6 at the intersection of these two arcs. Points 7, 8 and 9 are located in the same manner.

The next step is to produce the location of line DC. We know the true length of line Dx from the top view. An arc from point D is circumscribed. Then we must determine the true length of line between point C and 9. An arc circumscribed from point 9 using this true length intersects line from point 9 and locates point C at the intersection.

To obtain the true length of lines from point C to 9, 10, 11, 12 and 13 we project these points to the side view as shown. True length of line from point C to 9 is the hypotenuse of the triangle using the distance from C to the corresponding projecting point from the top view as the base of the triangle and the other side of the triangle to be equal to the vertical distance between horizontal plane of point C and horizontal plane of point 9. It can be very readily seen from the side view how these true lengths are obtained.

It has been explained that the intersection of the two arcs from points D and 9 locates point C. Then a line is drawn between D and C which is the correct location for line DC. Then from the side view the true length of the line from point C to point 10 is obtained in the same manner as from C to 9. An arc is circumscribed from point C equal to this distance, another arc from point 9 is circumscribed equal to the length between points 9 and 10 definitely locating point 10.

Points 11, 12 and 13 are located in the same manner.

The next step would be to locate line CB. The true length of line CD is represented on the top view. An arc is circumscribed from point C equal to this true length then the true length from point B to point 13 is located from the top view in the same manner as described by determining the true length of lines from point C. Using the true length between points B and 13 an arc is circumscribed from point 13 which will intersect the arc circumscribed from point C which will definitely locate point B. Line BC can then be drawn.

Points 14, 15, 16 and 1 are located in the same manner as previous points using point B as point from which the arcs are circumscribed.

The next step would be to locate point A and line AB. The true length of line AB is shown on the top view. An arc using this true length is circumscribed from point B and we have true length of line

(*Continued on page* 48)

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congres of August 24, 1912,

of AMERICAN ARTISAN—THE WARM AIR HEATING AND SHEET METAL JOURNAL, published bi-weekly at Chicago, Illinois, for April 1, 1930.

State of Illinois, County of Cook—ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared Etta Cohn, who, having been duly sworn according to law, deposes and says that she is the business manager of AMERICAN ARTISAN—THE WARM AIR HEATING AND SHEET METAL JOURNAL, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher — Porter-Spofford-Langtry Corp., 139 N. Clark St., Chicago, Ill.

Editor—Joseph David Wilder, 139 N. Clark St., Chicago, Ill.

Managing Editor—

Business Manager—Etta Cohn, 139 N. Clark St., Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

Porter-Spofford-Langtry Corp, 139 N. Clark St., Chicago, Ill.

H. H. Bede, 139 N. Clark St., Chicago, Ill.

J. C. Langtry, 139 N. Clark St., Chicago, Ill.

F. D. Porter, 139 N. Clark St., Chicago, Ill.

C. W. Spofford, 5 S. Wabash Ave., Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

AMERICAN ARTISAN AND HARDWARE RECORD, INC.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securties in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is..... (This information is required from daily publications only.)

ETTA COHN,
Business Manager.

Sworn to and subscribed before me this 7th day of April, 1930.

(Seal) SARAH B. BOYNTON.

(My commission expires October 16, 1932.)

Hartman Built Himself a Marquise—

This shows the marquise Hartman built in front of his own shop. This one sold one firm 17 and is selling others right along.

IT may be a little early to predict that the sheet metal field is turning to specialization, but there is a noticeable trend in that direction.

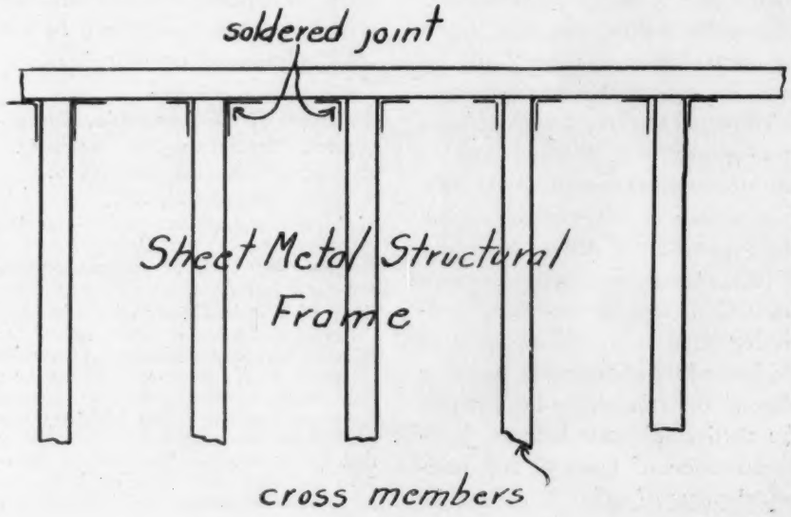
In many cases this trend has not been sought after, but has grown as a result of unexpected turns of fortune. And in this day of keen competition and aggressive selling it behooves every sheet metal contractor to grasp opportunity when it comes his way and set it to work.

This specializing has been called to our attention several times recently. Just the other day we ran across a case which is very much to the point and while the contractor has not made the specialty his especial field he has made it pay him handsome profits.

In Terre Haute, Indiana, the sheet metal firm of Hartman and Company enjoys an enviable reputation among the building trades. It is an established firm and has built its business more along the lines of sound reputation for quality work and right prices than by pursuing aggressive sales campaigns. In this firm's case this policy has worked 100 per cent.

Last year when work slowed down Mr. Hartman decided that he needed a nice looking marquise over the sidewalk in front of his shop. He had had some temporary awnings, but they had been both costly and troublesome. Also he figured out that a marquise would be a good advertisement and would give him a splendid opportunity to make the marquise advertise his firm's name and business. So the boys were put to work in spare moments designing an attractive marquise and putting it on the store front.

One of the photographs which accompany this article shows the



AND SOLD ONE FIRM 17

marquise he designed and built. The design and construction are plain, but ornamental enough to make a frame for the advertising carried around the rim.

The construction plan worked out is interesting in that no wood is used in the framework. The outline of the frame is not rectangular, but five sided. The framework is composed of built up sheet metal members consisting of an outside frame and roof supporting braces which run across the short dimension of the frame.

The members were formed of 24 gauge metal into a rectangular, hollow box with a standing seam along the top side. This shows in the cross section drawing. These cross members were soldered to the outside members to form a rigid framework for the covering.

The covering is of 20 gauge metal in sheets just as wide as the distance between the cross members of the frame. The sheet is formed to a standing seam along the cross member. On the top it shows as a standing seam roof, while from below the covering sheets are smooth panels between the cross members.

The outer frame carries a sheet metal molding, paneled to frame the advertising of the firm as shown in the photograph. This molding is approximately 10 inches deep and is topped with a sheet metal cresting of factory built units. The marquise is supported by three chains which are hung from the brick front.

It required some amount of spare time to build this marquise and no accurate costs were kept on the job. But the real meat of this story comes from the after effects.

In Terre Haute there is a chain of retail stores known as the Oakley Stores. This firm operates a long string of these stores and has a number in Terre Haute. One of the troubles they have had in the past is with their awnings. They

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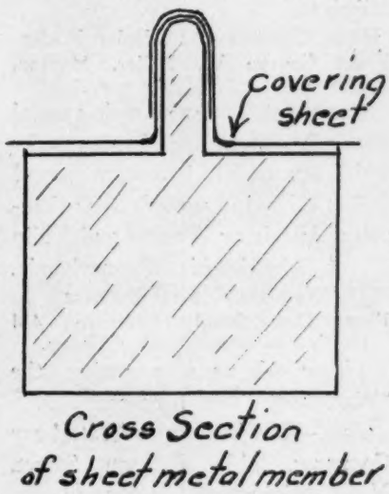


Cross Section of sheet metal member

This is one of the marquises sold to the chain store owner. Notice how much it adds to the appearance of the front.

"Puritan" Oil Stove

From M. G. Combes, Shellsburg, Iowa.

Can you tell me who makes the "Puritan" oil stove?

Ans.—Perfection Stove Company, 7609 Platt Avenue, Cleveland, Ohio.

Metal Enamel Tile for Bathrooms

From J. L. Liptrap, 8331 Seward Park Avenue, Seattle, Washington.

Please advise me who makes metal tile for bathrooms.

Ans.—The Duratile Company, Mishawaka, Indiana; The Erie Enameling Company, Erie, Pennsylvania, and Porcelain Tile Company, 228 North La Salle Street, Chicago.

"Arex" Ventilator

From Duba Sheet Metal Works, Worthington, Minnesota.

We should like to know who makes the "Arex" ventilator.

Ans.—The Arex Company, 333 North Michigan Avenue, Chicago.

Rectangular Tin Cans

From Radio Units Company, P. O. Box 84, Salt Lake City, Utah.

Please advise what firm can furnish rectangular tin cans from stock.

Ans.—American Can Company, 104 South Michigan Avenue, Chicago.

Vacuum Furnace Cleaners

From Homer Furnace Sales and Service, Room 3, Palace Theater Building, Flint, Michigan.

Can you tell us who makes furnace vacuum cleaners?

Ans.—Brillion Furnace Company, Brillion, Wisconsin; Gottschalk Heating Company, Covington, Kentucky; The Kent Company, Inc., 103 Canal Street, Rome, New York; National Super Service Company, Toledo Factories Building, Toledo, Ohio; Williamson Heater Company, Cincinnati, Ohio; B. F. Sturtevant Company, Hyde Park, Boston, Mass.

"Belknap" Generator

From J. J. Herlick, Box 473, Harvey, North Dakota.

I should like to know who makes the "Belknap" generator.

Ans.—Belknap Manufacturing Company, Bridgeport, Connecticut.

"Everite Triplex" Oil Stove

From Charles Kannan, care Penfield's, 56th and Q Streets, South Omaha, Nebraska.

Can you tell me who manufactures the "Everite Triplex" oil stove?

Ans.—Globe Machine & Stamping Company, 1300 West 76th Street, Cleveland, Ohio.

Water Softeners

From J. J. Herlick, Box 473, Harvey, North Dakota.

Please advise me who makes water softeners.

Ans.—International Filter Company, 333 West 25th Place, Chicago; Stover Steel Tank & Manufacturing Company, Freeport, Illinois; Wm. B. Scaife & Sons, First National Bank Building, Pittsburgh, Pennsylvania, and Zeolite Chemical Company, 140 Cedar Street, New York City.

Repairs for "Alamo" Heater

From Waterman-Waterbury Manufacturing Company, Ltd., Regina, Saskatchewan.

Where can we secure repairs for the "Alamo" heater formerly made by Charles Smith of Chicago?

Ans.—Smith-Gray Heater Company, Muskegon, Michigan.

Copper and Brass Research Association's Reports, Etc.

From L. J. Ensweiler, 625 North Main Street, Crown Point, Indiana.

Where can I secure the Copper and Brass Research Association's Journal of Research and reports?

Ans.—Mr. L. C. Leimkuehler, Mid-Western Representative, Copper and Brass Research Association, 1360 Builders Building, Chicago.

Sanitary Caustic Closets

From Schwarzkopf Sheet Metal Works, Waupaca, Wisconsin.

Can you tell us who, besides Waterman-Waterbury, and Smith System, make a caustic sanitary closet?

Ans.—Dowagiac Steel Furnace Company, Dowagiac, Michigan; Independent Register & Manufacturing Company, 3747 East 93rd Street, Cleveland, Ohio; Hart Manufacturing Company, Louisville, Kentucky; Dail Steel Products Company, Lansing, Michigan, and Shiel Manufacturing Company, Hillsdale, Michigan.

For Protecting Hardware Trim

From Riverside Hardware Company, 2231 Riverside Boulevard, Sioux City, Iowa.

Is there a special coating to place on hardware trim that protects the finish and keeps it from tarnishing?

Ans.—A coat of white shellac will answer the purpose.

Repairs for "Lundy" Firepot

From W. H. Brabazon, P. O. Box 321, Beloit, Wisconsin.

Where can I secure repairs for the "Lundy" tinner's firepot?

Ans.—This was made by the Double Blast Manufacturing Company of North Chicago, Illinois, now out of business, and we do not know of anyone who can furnish repair parts.

Copper Cut-offs in Centennial Pattern

From Poehner & Dillman, 417 Cass Street, Joliet, Illinois.

Please tell us who makes 3 and 4-inch square corrugated copper cut-offs in the Centennial pattern.

Ans.—The Allred Manufacturing Company, Inc., 2829-31 Northwestern Avenue, Indianapolis, Indiana.

Skuttle Furnace Cleaner

From B. J. W. Berghorst, Zeeland, Michigan.

Who makes folded or jointed handles with a sort of cup attached for cleaning warm air furnaces?

Ans.—This is known as the Skuttle furnace cleaner and is made by The J. L. Skuttle Manufacturing Company, Dowagiac, Michigan.

Metal Counters and Display Racks

From George W. Miller, Morton, Illinois.

Can you tell me who makes metal stands, counters and display racks which are used in hardware stores?

Ans.—David Lupton's Sons Company, Allegheny Avenue and Tulip Street, Philadelphia, Pennsylvania.

"Waterbury" Steel Furnace

From Carr Supply Company, 414 North Dearborn Street, Chicago.

Please tell us who makes the "Waterbury" steel furnace.

Ans.—The Waterman-Waterbury Company, 1121 Jackson Street, N. E., Minneapolis, Minnesota.

ASSOCIATION ACTIVITIES

Issue Tentative Program For 12th Annual Meeting American Zinc Institute

A tentative program for the twelfth annual meeting of the American Zinc Institute has just been announced.

The convention will be held in the Statler Hotel, St. Louis, Mo., on April 14, 15 and 16.

This year's program is replete with interesting and valuable papers and discussions, and a large attendance is expected and has been provided for.

The first morning's program will be given over to registration, the address of welcome by the mayor of St. Louis, the introductory address of the president, R. M. Roosevelt, and the response by Frank Childress.

The afternoon of the opening day will have as principal discussion an address, "What the Institute Should Mean to Its Members," by Dr. Hugh Baker, manager, Trade Association Department, Chamber of Commerce of the United States.

This address will be followed by reports of all standing committees and an open forum on association affairs. In the evening the annual smoker will be staged.

The second day's program will be as follows:

Morning Session—Subject: Markets for Zinc.

"Zinc in Galvanizing," Geo. A. Charls, president, National Association of Flat Rolled Steel Manufacturers.

"Zinc in Brass," William A. Willis, manager, Copper & Brass Research Association.

"Rolled Zinc Products"—Speaker to be announced.

"Zinc in Die-Casting," Robert M. Curts, Technical Service Division, the New Jersey Zinc Company.

"Zinc Oxide" — Film showing manufacture of zinc oxide from mine to finished product.

"Value of Research in Nonferrous Metals," Dr. H. W. Gillett, director, Battelle Memorial Institute.

Afternoon Session — Directors' meeting. Golf tournament.

Evening—Annual banquet. Con McCole, Wilkes-Barre, Pa., will be the speaker.

Wednesday, April 16

Morning Session—Subject: Zinc Mining Developments.

New York—Speaker to be announced.

Tennessee-Virginia — Howard I. Young, vice-president, American Zinc, Lead & Smelting Company.

Wisconsin-Illinois—W. N. Smith, general manager, Vinegar Hill Zinc Company.

Tri-State District—M. D. Harbaugh, secretary, Tri-State Zinc & Lead Ore Producers' Association.

Rocky Mountain Region—J. O. Elton, manager International Smelting Company.

Idaho—Speaker to be announced.

New Mexico—Speaker to be announced.

Arizona—Oliver C. Ralston, Director of Research, United Verde Copper Company.

Review of European zinc situation.

Afternoon Session—Subject: Technical Developments in Zinc Production. Speakers to be announced.

Oil Burner Men's Convention Biggest Show in Oil Industry

The seventh annual convention of the American Oil Burner Association, held in Chicago April 7-12, eclipsed anything ever attempted by the industry before. Thirty days before the convention 71 exhibitors had contracted for 109 booths for the display of oil burners and accessories.

A significant development of the exhibition, the first of its kind designed to attract the consumer and general public as well as the trade, was the interest displayed by oil refiners and distributors. Two nationally known oil companies had booths for display purposes and the Burning Oil Distributors' Association of Chicago reserved three. Additional booths had to be provided to meet the demands of exhibitors.

The convention program was arranged so that merchandising and engineering sessions were held in the morning, leaving members free to attend the show in the afternoons and evenings.

The program opened with a meeting of the executive committee, followed by a meeting of the board of directors. The annual members' meeting was held Tuesday morning, at which the new board of directors was elected. Wednesday and Thursday mornings were given over to merchandising sessions, while the engineers held sway on Friday. The annual banquet was followed by a dance held Thursday night. The only speaker was Ward Threatt of Charlotte, N. C., well-known southern humorist.

Announce Date for Fort Wayne, Indiana, District Meeting

Frank DeWeese, District Governor of the Fort Wayne District of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana, announces that the district meeting of the Fort Wayne district, scheduled for May 2, will be held at Huntington, at the LaFontaine Hotel.

HARTMAN SELLS MARQUISES

(*Continued from page* 41)

used the canvas type and had to replace and repair them constantly. In fact their cost was excessive and their appearance doubtful.

The owner of the chain passed Hartmans frequently and all during the time Hartman's marquise was under construction he was an interested onlooker. He followed every detail of its erection closely and showed the liveliest interest. After the marquise was completed he stopped in and wanted to know how much a duplicate would cost. He wanted one put on one of his stores.

Mr. Hartman had to admit that he did not know the exact cost and explained that it was a spare time and piecemeal job and that it was strung out over a considerable period of time. However, he assured the chain store owner that the cost was reasonable and that the cost would be forgotten long before any attention would have to be given the metal marquise. He sold the idea of permanence.

So an order was given to erect one of similar construction and design on one of the stores. Accurate costs were kept all through the job and these were shown the store owner. He thought the costs reasonable and ordered another. Before this one was finished he stopped in and asked how much the firm would reduce costs if he gave an order for nine marquises. But Hartman was not fooled. He knew that his costs were set and that quantity could not cut the cost appreciably and that nine would cost just as much per unit as two. So he said that he couldn't cut the cost and pointed out why.

The result was that he got the order for nine at the same unit cost as the first two. These were designed and placed in position. Their appearance was commented on by the store's customers and their practicability was tested and approved by the public in the first rain storm.

Almost before the nine were out of the shop the owner was back with another order, this time for six more. This total of 17 marquises placed a marquise on every store the chain owns. The ones they rent are still using canvas, but as quickly as the stores are purchased a metal awning is ordered for the front.

These marquises have led to sales to other store owners and such places as movie houses and hotels. The first marquise led to a string of them and these are now leading to marquises for other businesses.

The important thing about this work is that it was done on a profitable basis. Where some would have been tempted to make a cut in price because of an order for a number of units, Hartman knew that his costs were set and that nine would not be appreciably less costly than two. He did not cut his price and still got the business. And so the business he has is all profitable business.

This sticking to known costs is a policy of Hartman's shop. He is doing some Monel metal work in sinks and other small units and in this work, too, is keeping costs in mind and charging above them. Hartman's has just completed a large church job on which there were installed ventilators, gutter, flashing and copper work to the extent of some 20,000 pounds of metal.

A COPPER CUPOLA

(*Continued from page* 37)

unit erected around a structural steel framework and painted to conform with the rest of the building would cost but very little more than the cupola as originally designed in wood, even though the winning bid involved much hand work.

The cupola, while utilizing copper, is designed to give the appearance of wood. The decorative scrolls and corners are in the style usually applied to wood, and the beads, sills and other features are made to represent wood construction. Extending upward from the gabled roof, the sides of the deck are made to resemble siding set off by wood blocks. In the centers of these sides are round, dummy ports, also featured in the style of wood construction. The balcony is surrounded by a railing made to look like a wooden rail mounted on posts and set off by a latticed grill, supposedly made of 2 by 2 lumber.

Over a ton of copper and 400 pounds of brass were used in the fabrication of the cupola and its balcony. It was made up completely in the shop of Huber-Richardson Sheet Metal Works and assembled on the job. Many of the circular sections were formed by hand to conform more nearly to the ideas of the architect. The only parts that were formed by machine were the more conventional details to be found above the windows.

In addition, there were more than 15,000 pounds of copper used on the building for gutters, downspouts, flashing and various other services. The exterior of the building is completely rust-proofed by copper. The principal's home which was erected adjacent to the school building is also protected against rust by the use of more than a ton of copper installed as gutters, flashing, leaders and similar items.

RELATIVE HUMIDITY

(*Continued from page* 29)

is dependent almost entirely on the relative humidity and also, to a slight extent, on the air temperature. It does not depend at all on the absolute humidity.

Most people do not understand this fact because they do not know that all hygroscopic materials pick up or lose moisture due to the prevailing relative humidity. Thus humidity is frequently discussed without any consideration of whether the relative or the absolute humidity is meant.—M. T.

National Warm Air Heating Association, Detroit, Mich., April 15, 16, 1930. A. W. Williams, 174 E. Long Street, Columbus, Ohio, Managing Director.

National Association of Sheet Metal Contractors, Fort Pitt Hotel, Pittsburgh, Pennsylvania, June 10 to 13, 1930. W. C. Markle, 336 Fourth Avenue, Pittsburgh, Secretary.

The Illinois Convention

(*Continued from page 36*)

much for one man to handle in addition to his own business, and Paul had to give up the job.

The work lagged for some time. I was requested to take the chairmanship, and at one of the first meetings we determined to make twelve sections of the book, and that each section was to be taken care of by one of the committee. Therefore, this divided the work up between twelve men, who all would share in their part. Finally, in September of 1929, the book was completed.

It is probably unnecessary to say much about the book as I believe that most of you have one. However, it may be well to say just a few words, showing the book, and going over it hurriedly.

That the book is considered of great value is demonstrated by the fact that already more than one-half of the first issue has been distributed. Many architects are already specifying according, and the trade schools and manual training schools are using the book to teach the students.

How can the book be put over? There is only one way. That is to visit every leading architect in the country, contractors, builders and sheet metal contractors. Show them the book, and see that they use it in connection with the work they do. This requires practical sheet metal men with proper business knowledge. As chairman of the Trade Development Committee, I have decided that the National should engage good men for this purpose. This will be well paid. We are now ready to send out these men. I believe that through this campaign it will be necessary to soon print another issue of the book, and I am confident that all will profit thereby. With a large force, the task will be quite easy, although the work will overlap, as the sale of the book in one community will benefit those in another location.

Calling for expressions from the floor, it soon developed that many men favored doing this work themselves, which was just what Mr. Harms wanted.

Mr. Harms then suggested that every man appoint himself a committee of one, and further suggested a special committee to apply the whip.

President Joe Walters then appointed John Meyers chairman and Chas. G. Soedler and J. L. Snelson as members of the committee to push the sale and distribution of the book.

Following this, A. P. Halim, president of the Travelers' Auxiliary, took charge of the joint meeting.

A general discussion took place and many helpful suggestions were made.

Following various committee reports the election of officers took place. The nominations were closed after Johnnie Meyers had enthusiastically nominated the present officers for another term of office.

Joseph J. Walters—President.

Frank I. Eynatten—Vice-President.

Charles L. Radtke—Secretary.

James Barrett—Treasurer.

The directors were also re-elected —Rudolph J. Jobst, Peter Beigler and Griff J. George.

Illinois Travelers' Auxiliary Meeting

At 2:30 Wednesday afternoon most of the travelers gathered for their annual meeting.

The lively, good natured group made enthusiasm in high and all the boys who were responsible for the banquet arrangement were complimented on their good work.

As usual, a lot of fun was had in selecting the world famous fifty per cent sergeants at arms, Herb Symonds and Jules Gerock. The officers for next year are as follows:

President—Fred Gottschalk.

Vice President—Jack Barclay.

Secretary—Etta Cohn.

Treasurer—Jack Sauer.

Sergeants at Arms—Herb Symonds and Jules Gerock.

Advisory Board—A. P. Halm, Wm. P. (Bill) Laffin, Roy Harrison, Mat Friedman.

Changes in Langenberg Mfg. Co. Officers Made Some Time Ago

Some weeks ago the Langenberg Manufacturing Company of St. Louis announced changes in the official personnel of the company. These changes were overlooked at the time and we now take the liberty of publishing them.

W. C. Raithel, who was general manager of the Mound City foundry division, was made sales manager. M. J. Turck was appointed general manager in place of Mr. Raithel.

As an interesting trade note the company states that they have established a Vitro Enamel Products Division for the manufacture and sale of vitreous enamel over cast iron. R. C. Scott, Missouri Hotel Building, St. Louis, is sales manager of this division.

New Officials Appointed by Inland Steel

Wilfred Sykes has been appointed assistant to the president of the Inland Steel Company, in charge of operations with headquarters at the company's Chicago offices. He succeeds the late David P. Thompson. Mr. Sykes has been assistant general superintendent of Inland's Indiana Harbor works since 1927.

James H. Walsh has been elevated from the position of general superintendent of Inland Steel Company's Indiana Harbor works to works manager of that plant. Mr. Walsh has served as general superintendent since 1927 and was assistant general superintendent since 1922.

Henry R. deHoll succeeds Mr. Walsh as general superintendent. Mr. deHoll has been associated with Inland since 1913, first as superintendent of the coke plants and more recently in charge of blast furnaces and coke plants.

Frederick M. Gillies replaces Mr. Sykes as assistant general superintendent.

NEW ITEMS *and* NEWS ITEMS
From and about the Manufacturers and Jobbers

Harry L. Wood,
Former Premier Official,
Passes Away in Colorado

A newspaper report brings us the information that Harry L. Wood, known to practically every man in the warm air furnace industry, has passed away in Colorado as a result of double pneumonia.

As a young man of 20 years, Mr. Wood went to St. Louis, Mo., and engaged in construction engineering but later returned to Detroit, Mich., and entered the hardware business with his father. This business was sold out in 1910 and Mr. Wood became associated with the Round Oak Furnace Company of Dowagiac, Mich., and then with some friends organized the Rudy Furnace Company, of which he was vice-president and sales manager.

After several years in this experience he organized his own company, the Premier Warm Air Heater Company, of which he was vice-president and general manager. Mr. Wood designed the furnaces now in use by this company and obtained patents on several features of this furnace. At the time of his death he was a director of this last named company.

Mr. Wood and family went to Colorado for his health in 1925 and a year later planned and built El Colorado Lodge, which has become a standard for tourist camps throughout the United States.

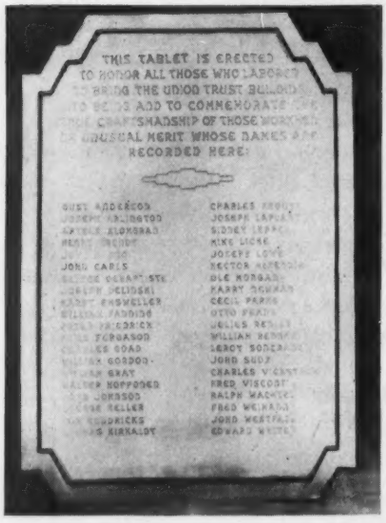
Being a lover of Indian lore and architecture, he made a study of Indian pueblos, Indian architecture and pottery, and his plans for the future development of El Colorado Lodge were extensive and beautiful.

His erection and plan of El Colorado Lodge were so unique and original that *Nation's Business, Woman's Home Companion* and *Success Magazine* published articles and pictures about this new phase of tourist accommodations for convenience of the motoring public.

One of Mr. Wood's last requests was for his burial in Manitou's Crystal Valley Cemetery.

Unveil Tablet
To Workers
Craftsmanship

For the first time on record, the owners of a building made an enduring acknowledgment to the craftsmanship of the workers who built it when Frederick J. Haynes,



president of the Durant Motor Company, unveiled a tablet in honor of the outstanding members of forty trades who erected the new Union Trust Building in Detroit.

The tablet, which was made of monel metal to harmonize with the rest of the ornamental metal work in the building, was erected in the main lobby. Five prominent Detroit residents were selected to serve as judges in choosing the one representative from each trade whose name appears on the tablet. In addition to this honor, each workman received a cash award and a colorful engraved replica of the building itself, framed, as a certificate of his skill.

The tablet records the workers' achievement in the construction of the forty-story building with this message: "This tablet is erected to honor all those who labored to bring the Union Trust Building into being and to commemorate the true craftsmanship of those workmen of unusual merit whose names are recorded here." The names of the forty are inscribed under this message.

Smith, Hinchman and Grylls, who designed the building, also designed the tablet, which was made by the Gorham Manufacturing Company, who fabricated much of the ornamental metal work and fixtures of the building.

Inland Steel
Employees Get
Stock Certificates

Inland Steel Company employes on April 1 received 16,102 shares of Inland common stock as a result of their participation in the company's Employes' Savings and Profit Sharing Pension Fund. Almost 900 employes received stock certificates.

Although participation in the fund is voluntary, more than 6,000 employes of the Inland Steel Company—three-fourths of the total number employed—are enrolled.

Any employe who has been with the company eighteen months is eligible to join. Participants contribute five per cent of their salary, but not over $300 per year, while the company's share is five per cent of net earnings before payment of any dividends. Inland common stock, purchased with these funds, is distributed to the employes at the end of five years' participation.

The plan has been in operation eleven years and this is, therefore, the seventh distribution of stock.

There's a big demand for MONEL METAL *in*

Canning Factories

for...

BINS
BRINERS
CHUTES
CONTAINERS
DIPPERS
ELEVATORS
FANS
FILTERS
FUNNELS
PAILS
PIPE LINES
SCREENS
SINKS
STRAINERS

It's a fertile market for YOU!

THE above list represents only a few of the major applications of Monel Metal in the canning industry. But it will help you visualize the profit possibilities that lie in the fabrication of canning equipment—especially when you consider that many of these articles must be custom-built to individual specifications!

Logically, this is a job for the sheet metal man—and the alert-minded craftsman who takes advantage of this opportunity will be "getting in on the ground floor." The canning industry is using Monel Metal in rapidly mounting volume because it possesses special properties that are absolutely essential to modern canning practice. It minimizes the danger of product contamination because it cannot rust and is highly resistant to corrosion by fruit acids. It is easy to clean, and its steel-like strength and toughness give maximum protection against denting and abrasion.

We will be glad to help you get your share of this profitable Monel Metal business. Literature specially prepared to influence your local canning plants together with other promotional service is yours for the asking. But be sure to ask for booklet entitled "Modern Ideas in Food Plant Sanitation". Write TODAY.

The fascinating story of Monel Metal—its properties and uses—is told in a new 2-reel motion picture film. Write for details of free distribution.

Monel Metal is extensively and consistently advertised to the canning executives through the leading business and technical papers covering that field and in the principal national magazines. In addition to stimulating keen buying interest in Monel Metal this advertising suggests that the reader get in touch with the local sheet metal worker. Be sure to take advantage of this extra merchandising service.

MONEL METAL

Monel Metal is a "technically controlled" Nickel-copper alloy of high Nickel content. It is mined, smelted, refined, rolled and marketed solely by The International Nickel Company. The name "Monel Metal" is a registered trade mark.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

INCO MONEL METAL

Say you saw it in AMERICAN ARTISAN—Thank you!

TABLE D

Bank	$2,750.00	
Rent	50.00	
Machinery	1,000.00	
Materials	500.00	
Supplies	50.00	
Total debit balances, representing Assets Owned and Expense Paid		$4,350.00
The credit balances are:		
Capital Account	$3,000.00	
Notes Payable	800.00	
Accounts Payable	550.00	
Total Capital and owing to others		$4,350.00

COST ACCOUNTING

(*Continued from page* 24)

You will observe that the debit equals $4,350.00, as do the credit balances. Our trial balance balances, proving that our ledger is correct. Our next step is to see where money has gone. The trial balance will show us. The debit balances are: (*Table D*).

Or, to state it another way, your capital of $3,000.00 plus $800.00 due on Notes Payable and $550.00 due on open account (or Accounts Payable) is now spread over five accounts—four representing assets (property owned) and one representing a prepaid expense (Rent).

In the next article these transactions will be shown posted to standard ledger sheets. It is suggested that you preserve this issue of the ARTISAN for reference in connection with the following articles on this subject. It is the purpose of this series of articles to carry the reader through a more or less complete outline of bookkeeping as applied to a warm air heating installer's shop. Each succeeding article will supplement the preceding one, and altogether they will make up a complete story well worth preserving.

INTERSECTION OF TWO PIPES

(*Continued from page* 25)

of the points on the stretchout line, of indefinite length, parallel to the center line of R. Now from each of the points on the line of intersection x-y-z draw lines intersecting at right angles, the lines just drawn from the points on the stretchout line C-D. Through these points of intersection draw the curved line describing the other end of the pattern P. This method of procedure is applicable regardless of the angle at which the two pipes are joined, so long as the pipes are of equal diameter.

OIL BURNERS AND THE DEALER

(*Continued from page* 21)

go to make that type of heat as reliable, as efficient and as modern as possible.

That will mean that instead of converting the warm air furnace dealer into a specialty salesman, he will be converted into a HEATING SALESMAN.

Of course, oil heat will be one of the accessories he will have in stock for his business. He will be able to sell the owner a coal-burning furnace if it is wanted with an automatic stoker to eliminate daily firing. He will sell oil burners if oil is the logical fuel for the owner. He may sell gas as the fuel.

But most important, he will sell a piece of equipment that also provides warmed air, circulated into the house, cleaned, washed, given the proper humidity, heated to just the right degree, and regulated so that the house will satisfy the owner morning, noon or night.

Into this complete system must be fitted such things as oil burners. But the burner will not be the end of the sale; rather it will be only a piece of equipment that does its part to make the completely designed plant function as the owner and the furnace man laid it out.

This may seem far-fetched. But frankly we don't think so. It can be and will be the answer to the oil burner man's statement that furnace men are not the specialty salesmen needed to sell burners. He isn't today; he probably won't be tomorrow.

But what he will be is a designer of heating plants who takes from this specialty field and that specialty field such equipment as meets the requirements of the job he has at hand, and from these specialties manufactures a heating system which is the last word in efficient, effortless heating.

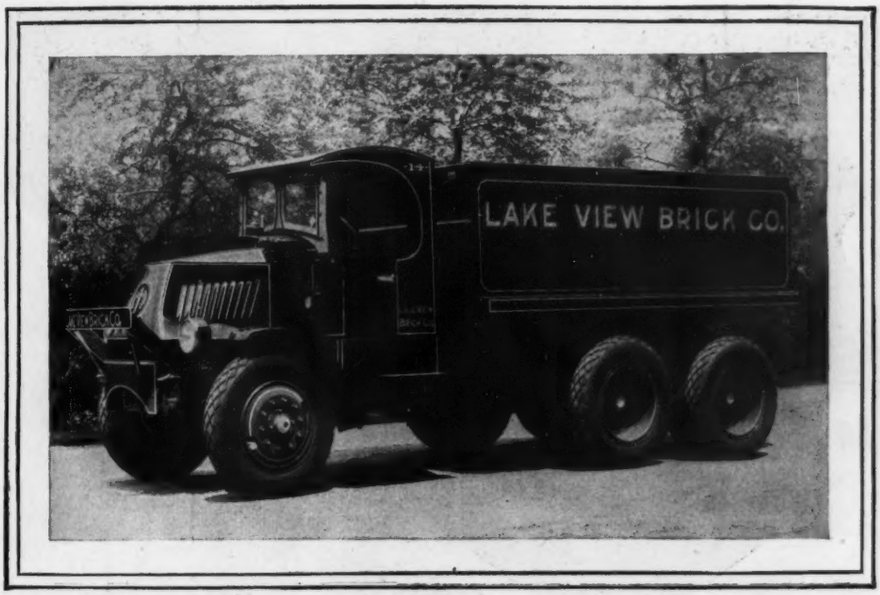
To this day when warm air comes into its own we must all contribute our share. Perhaps it would be well if some of our furnace men became the agents for a burner and REALLY tried to apply the sales procedure the manufacturers have found workable. Such education cannot do harm—it can, in fact, be a good training for that day when the complete heating plant—not just another specialty unit—becomes the heating plant of the American home.

DEVELOPING AN END BOOT

(*Continued from page* 39)

A1 located on the first portion of the development. Using this distance an arc is circumscribed from point 1 which will intersect the arc circumscribed from point B which will definitely locate B and line AB is then drawn.

As stated before, it is felt that the best place for the seam is on the line A1. A double lock seam is indicated by the dotted lines. The vertical extension on the rectangular portion of this fitting is shown on the dotted lines. In the corner of this rectangular opening is point D, the vertical extension of the rectangular portion will not be entirely closed at the corner. This is easily seen from the development. The fitting which is attached to this vertical extension will, however, make a tight joint.



Body of Inland Copper Alloy Steel Sheets.

THE BEST RUST-RESISTING SHEETS HAVE THE *LOWEST* FIRST COST

Buying rust and corrosion-resisting sheets differs in one respect from buying other materials. Copper-bearing steel sheets . . . those which last the longest . . . are also the cheapest, costing less than any other rust or corrosion-resisting sheets and only slightly more than ordinary sheets.

Save with Steel

INLAND Copper Alloy STEEL

That copper-bearing steel sheets last longer than ordinary steel sheets and considerably longer than other sheets in the rust-resistant class is proved by the findings of the American Society for Testing Materials. The U. S. Bureau of Standards, too, finds that copper adds more to the life of steel sheets than the purity of iron or steel.

Inland Copper-Alloy Steel Sheets save when you buy them . . . save by pushing back the replacement date. They are available in various grades and finishes and in all standard gages for a multitude of applications. They are produced by Inland Experience, under Inland Inspection and are always promptly available.

Write for the new booklet, "Inland Open-Hearth Sheet Steel Products", which describes Inland Copper-Alloy and the many other Inland Steel Sheets.

INLAND STEEL COMPANY

ABLE SERVANT OF THE CENTRAL WEST

38 SOUTH DEARBORN STREET, CHICAGO

Sheets Bars Plates Structurals Rails Track Accessories Rivets Billets

"INCREASING GOOD WILL"

is just another way of saying

"Paving the Way to Greater SALES"

Hundreds of thousands of dollars will be spent in 1930 to bring the use of galvanized sheets to the attention of the rural sections of the country.

Millions of farmers will read convincing messages such as the one shown on the opposite page, impressing upon them the great savings and protection that galvanized sheets have to offer.

This immense market for galvanized sheet products has scarcely been scratched. It is idly waiting for you to cultivate it. The steel industry is spending large sums to create good will toward galvanized sheet farm products and to stir up interest to the buying point. Make sure that the farmer knows you are the one in his neighborhood to supply his wants. One method is by mailing him literature setting forth the reasons he should buy such products. Two-color proofs of the advertisement on the next page, for mailing purposes, are yours in any quantity for the asking. Get your supply now.

Any facts you desire about galvanized sheet products for the farm will be supplied if you will write to Trade Research Division, National Association of Flat Rolled Steel Manufacturers, Terminal Tower, Cleveland, Ohio.

GALVANIZED SHEETS
Protect *against lightning and fire*

96 Farm Buildings Burned Today!

Protect Yours with GALVANIZED SHEETS!

EACH day last year, on the average, ninety-six farm buildings burned. $150,000,000 of rural property is destroyed annually. Thirty-five hundred lives are lost.

A large part of this loss can be charged directly to improper roofing materials. Of the ninety-six farm buildings burned, approximately fourteen would have been saved from destruction by lightning, if they had been covered with galvanized roofing properly grounded. Six more caught fire from sparks on combustible roofing—something which could not have happened if galvanized sheets had been used. Still others were consumed due to fire-spreading from one structure to another.

It is a conservative estimate that galvanized sheets properly grounded could have saved the farmers of this country forty millions of dollars in 1929.

Protect your family, your buildings, your live stock, your stored crops. Galvanized roofing properly grounded (according to the specifications of the U. S. Bureau of Standards) provides an inexpensive method of roofing and, at the same time, protects against fire and lightning. If you are not already familiar with this low cost method of obtaining protection, write

Trade Research Division
National Association Flat Rolled Steel Manufacturers
Terminal Tower, Cleveland, Ohio

GALVANIZED SHEETS
This free booklet will give you simple directions for obtaining lightning protection at very low cost. Write for your copy.

GALVANIZED SHEETS
Protect against lightning and fire

The advertisement above will appear in the April issues of Southern Agriculturist, Country Gentleman, Successful Farming, Capper's Farmer and Agricultural Engineering. 12,000,000 messages to help you sell more galvanized roofing. Proofs, for mailing purposes, will be sent free upon request. Also, copies of the book, "How to Ground a Galvanized Roof Against Lightning." Send for them.

Chicago Warehouse Metal and Furnace Supply Prices

AMERICAN ARTISAN is the only publication containing Western Metal, Furnace Supply and prices corrected bi-weekly.

Note: These Prices Are Chicago Warehouse Prices of Metal, to Which Must Be Added Freight to Cities Outside of Chicago.

METALS

PIG IRON

Chicago Fdy., No. 2 ..... $19 50
Southern Fdy. No. 2, 18 20 to 19 01
Lake Superior Charcoal.... ..... 23 04 to 27 04
Malleable 19 50

FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC	20x28 112 sheets	$22 50
IX	20x28	25 50
IXX	20x28 56 sheets....	14 50
IXXX	20x28	15 50
IXXXX	20x28	17 00

TERNE PLATES

	Per Box
IC 20x28, 40-lb. 112 sheets.	$25 00
IX 20x28, 40-lb. 112 sheets.	27 75
IC 20x28, 25-lb. 112 sheets.	21 15
IX 20x28, 25-lb. 112 sheets.	23 80
IC 20x28, 20-lb. 112 sheets.	19 55
IX 20x28, 20-lb. 112 sheets.	22 05

"ARMCO" INGOT IRON PLATES

No. 8 ga.—100 lbs. $4 15
3/16 in.—100 lbs. 4 05
¼ in.—100 lbs. 3 85

COKE PLATES

Cokes, 80 lbs., base, 20x28. $12 00
Cokes, 90 lbs., base, 20x28. 12 20
Cokes, 100 lbs., base, 20x28. 13 75
Cokes, 107 lbs., base, IC 20x28 ..... 12 75
Cokes, 135 lbs., base, IX 20x28 ..... 14 75
Cokes, 158 lbs., base, 2X 56 sheets 8 50
Cokes, 175 lbs., base 3X, 56 sheets 9 35
Cokes, 195 lbs., base 4X, 56 sheets 10 25

BLUE ANNEALED SHEETS

Base 10 ga.....per 100 lbs. $3 35
"Armco" 10 ga. per 100 lbs. 4 15

ONE PASS COLD ROLLED BLACK

No. 18-20 .....per 100 lbs. $3 85
No. 22 .....per 100 lbs. 4 00
No. 24 .....per 100 lbs. 4 05
No. 26 .....per 100 lbs. 4 15
No. 27 .....per 100 lbs. 4 20
No. 28 .....per 100 lbs. 4 30

GALVANIZED

No. 16 .....per 100 lbs. $4 10
No. 18 .....per 100 lbs. 4 20
No. 20 .....per 100 lbs. 4 40
No. 22 .....per 100 lbs. 4 45
(Standard differentials on extras to apply)
No. 24 .....per 100 lbs. $4 60
No. 26 .....per 100 lbs. 4 85
No. 27 .....per 100 lbs. 4 95
No. 28 .....per 100 lbs. 5 10
"Armco" 24.....per 100 lbs. 6 15

BAR SOLDER

Warranted 50-50 per 100 lbs. $25 25
48-52 .....per 100 lbs. 24 10
45-55 .....per 100 lbs. 23 05
Plumbers' .....per 100 lbs. 21 15

ZINC

In Slabs $7 35

SHEET ZINC

Cask Lots (600 lbs.)..... $12 00
Sheet Lots (100 lbs.)..... 13 00

BRASS

Sheets, Chicago base..... 24¼c
Mill base 23¼c
Tubing, brazed, Chicago base 31¾c
Mill base 30¾c
Tubing, seamless, Chicago base 29¼c
Mill base 28¼c
Wire, Chicago base..... 24¾c
Mill base 23¾c
Rods, Chicago base..... 22¼c
Mill base 21¼c

COPPER

Sheets, Chicago base..... 27¾c
Mill base 26¾c
Tubing, seamless, Chicago base 30¼c
Mill base 29¼c
Wire, plain rd., 8 B. & S. Ga. and heavier 25¾c

LEAD

American Pig $6 50
Bar 8 50

TIN

Bar Tin .....per 100 lbs. $42 00
Pig Tin .....per 100 lbs. 40 00

SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES.

ASBESTOS

Paper up to 1/16.....6c per lb.
Roll board .....7½c per lb.
Mill board 3/32 to ½.. 7½c per lb.
Corrugated paper (250 sq. ft. to roll)....$6 00 per roll

ASBESTOS SEGMENTS

8 in. .....per 100 sets $7 30
9 in. .....per 100 sets 8 30
10 in. .....per 100 sets 9 30
12 in. .....per 100 sets 10 50

CEMENT, FURNACE

American Seal, 5-lb cans, net $0 40
American Seal, 10-lb. cans, net 0 80
American Seal, 25-lb. cans, net 2 00
Pecora .....per 100 lbs. 7 50

CLIPS

Damper

No-Rivet Steel, with tail pieces, per gross.....$9 50
Rivet Steel, with tail pieces per gross 7 50
Tail pieces, per gross..... 2 40

CORNICE BRAKES

Chicago Steel Bending

Nos. 1 to 6B.....Net

CUT-OFFS

Gal., plain, round or cor. rd.
26 gauge 30%
28 gauge 35%

DAMPERS

Yankee Hot Air

7 inch, doz..... $1 60
8 inch, doz..... 2 20
9 inch, doz..... 2 60
10 inch, doz..... 2 80
12 inch, doz..... 3 50
14 inch, doz..... 5 00

EAVES TROUGH

Galv. Crimpedge, crated..75-10%
Zinc, "Barnes" 60%

ELBOWS

Conductor Pipe

Galv. plain or corrugated, round flat Crimp,
28 gauge 60%
26 gauge 45%
24 gauge 15%

Galv. Terne Steel

Plain Rd. and Rd. Corr.
28 gauge 60%
26 gauge 45%
24 gauge 15%

Square Corrugated

28 gauge 50%
26 gauge 35%

Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.
Not nested .....70 & 5%
Nested solid .....70 & 5%

Sq. Corr., A. & B. & Octagon

28 gauge 50%
26 gauge 35%

Portico

1, 1¼, 1½ inch.....45%

Copper

16 oz., all designs.....40%

Zinc

All styles 60%

ELBOWS—Stove Pipe

1-piece Corrugated. Uniform Blue "Milcor" No. 28 Gauge. Doz.
5 inch $1 15
6 inch 1 25
7 inch 1 75

Special Corrugated

6 inch $1 00
7 inch 1 60

Adjustable—Uniform Blue

"Milcor" No. 28 Gauge. Uniform Blue.
5 inch $1 60
6 inch 1 75
7 inch 2 10

WOOD FACES—60% off list.

FIRE POTS

Geo. W. Diener Mfg. Co.	Each
No. 02 Gasoline Torch, 1 qt.	$5 13
No. 9250, Kerosene, or Gasoline Torch, 1 qt....	6 50
No. 10 Tinner's Furn. Square tank, 1 gal.....	11 20
No. 15 Tinner's Furn. Round tank, 1 gal.....	10 70
No. 21 Gas Soldering Furnace	8 00
No. 110 Automatic Gas Soldering Furnace	10 50

GLASS

Single and Double Strength, A, all brackets.....85%
Single and Double Strength, B, all brackets.....87%

HANGERS

Conductor Pipe

Milcor Perfection Wire.....25%
Milcor Triplex Wire.....10%

Eaves Trough

Milcor Steel (galv. after forming) from list 45%
Milcor Selflock E. T. Wire, List 10%

HOOKS

Conductor

"Direct Drive" Wrought Iron for wood or brick..15%

MITRES

Galvanized steel mitres

28 gauge 70
26 gauge 60-20

PASTE

Asbestos Dry Paste

200-lb. barrel $15 00
100-lb. barrel 7 75
50-lb. pail 4 50
25-lb. pail 2 50
10-lb. bag 1 20
5-lb. bag 60

PIPE

Galvanized

Crated and nested (all gauges) 75-7½%
Crated and not nested (all gauges) 75-2½%

Furnace Pipe

Double Wall Pipe and Fittings 60%
Single Wall Pipe, Round Galvanized Pipe 60%
Galvanized and Tin Fittings 60%

Lead

Per 100 lbs..... $12 50

Stove Pipe

"Milcor" "Titelock" Uniform Blue Stove
28 gauge, 5 inch U. C. nested $11 00
28 gauge, 6 inch U. C. nested 12 00
28 gauge, 7 inch U. C. nested 14 00
30 gauge, 5 inch U. C. nested 10 25
30 gauge, 6 inch U. C. nested 11 00
30 gauge, 7 inch U. C. nested 13 00

T-Joint Made up

6 inch, 28 ga.....per doz. $3 40

REGISTERS AND FACES

Floor Registers

Except Cast Iron.....40&10%
Cast Iron 20%

Baseboard

2-Piece .....40&10%
1-Piece .....40-10&20%

Adjustable Ventilators

Adjustable Cold Air Faces 40&10%
Adjustable Ventilators....40&10%

RIDGE ROLL

Galv. Plain Ridge Roll, b'dld 75-15-5%
Galv., Plain Ridge Roll, crated 75-15%

SCREWS

Sheet Metal

7, ½x⅛, per gross..... $0 52
No. 10, ¾x3/16, per gross 68
No. 14, ⅞x¼, per gross.. 83

SHEARS, TINNERS' & MACHINISTS'

Viking $22 00

Lennox Throatless

No. 18 .....35%
Shear blades 10%
(f. o. b. Marshalltown, Iowa)

SHOES

Galv. 28 Gauge, Plain or Corrugated, round flat crimp..60%
26 gauge, round flat crimp...45%
24 gauge, round flat crimp...15%

SNIPS, TINNERS'

Milcor .....Net

VENTILATORS

Standard .....30 to 40%
Milcor .....Net

ARMCO INGOT IRON

increases profits and *satisfies* customers

C. W. Vanatta, sheet metal contractor of Columbia, Missouri, is an enthusiastic user of Armco INGOT IRON. Here he is shown (at the right) with his men, while working on a difficult job for a fraternity at the University of Missouri.

SHEET metal contractors who use Armco INGOT IRON know how it stimulates business. Customers accept it readily, are pleased with its long, trouble-free service. One job leads to another. More work, and *profitable* work.

For years Armco INGOT IRON has been known as the metal that fights rust. It has the longest record of *actual service* of any low-cost, rust-resisting sheet metal. Important, too, is Armco INGOT IRON's workability. It responds quickly to severe formings with little or no wastage.

You, too, can have these advantages. The next time you need sheets and formed products, order Armco INGOT IRON. Give it a fair trial and see if it doesn't sell easier and reduce shop costs.

Hear the famous
ARMCO CONCERT BAND
every Tuesday night
WLW-700K.-Cincinnati
Ten to eleven E.S.T.

This is the familiar symbol that identifies Armco INGOT IRON sheets and formed products. It stands for the skill and experience of Armco—a company that has pioneered and specialized in the manufacture of high-grade special analysis iron and steel sheets for nearly thirty years. Always point out this triangle to customers, so they may know they are getting long-lasting, low-price sheet metal.

THE AMERICAN ROLLING MILL COMPANY
Executive Offices, Middletown, Ohio
Export: The Armco International Corporation

DISTRICT OFFICES: Chicago, Cincinnati, Cleveland, Detroit, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco

"BE SURE IT'S MADE OF ARMCO INGOT IRON"

BUYERS' DIRECTORY

Asbestos Paper Products.
Sall-Mountain Co., Chicago, Ill.

Air Cleaners.
Meyer & Bro. Co., F., Peoria, Ill.
Watt Mfg. Co., Sterling, Ill.

Air Conditioning Machines.
Watt Mfg. Co., Sterling, Ill.

Asbestos Paper.
Sall- Mountain Co., Chicago, Ill.

Blast Gates.
Berger Bros. Co., Philadelphia, Pa.

Blowers—Furnace.
Brundage Co., Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.

Bolts—Stove.
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Bending.
Dreis & Krump Mfg. Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Cornice.
Dreis & Krump Mfg. Co., Chicago, Ill.

Brass and Copper.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Copper & Brass Research Association, New York, N. Y.
Revere Copper & Brass, Rome, N. Y.

Bronze.
Revere Copper & Brass, Rome, N. Y.

Cans—Garbage.
Diener Mfg. Co., G. W., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Castings—Malleable.
Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal.
Eller Manufacturing Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Chaplets.
Fanner Mfg. Co., Cleveland, Ohio

Cleaners—Vacuum.
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Copper.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.
Rockford Sheet Steel Co., Rockford, Ill.

Cornices.
Eller Manufacturing Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo,. La Crosse, Kan. City

Cut-offs—Rain Water.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Dampers—Quadrants—Accessories.
Eller Mfg. Co., Canton, Ohio
Howes Co., S. M., Boston, Mass.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Parker-Kalon Corp., New York, N. Y.

Dampproofings.
Lastik Products Corp., Pittsburgh, Pa.

Damper Regulators.
H. M. Sheer Co., Quincy, Ill.

Dies—Punch & Press.
La Salle Machine Works, Chicago, Ill.

Diffuser—Air Duct.
Aeolus-Dickinson Co., Chicago, Ill.

Drills—Electric.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Drive Screws—Hardened Metallic.
Parker-Kalon Corp., 200 Varick St., New York

Dust Eliminator.
Dustless Ash Co., Muskegon, Mich.

Eaves Trough.
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Eller Mfg. Co., Canton, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Rockford Sheet Steel Co., Rockford, Ill.

Elbows and Shoes—Conductor.
Barnes Metal Products Co., Chicago, Ill.
Eller Mfg. Co., Canton, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Rockford Sheet Steel Co., Rockford, Ill.

Fittings—Conductor.
Barnes Metal Products Co., Chicago, Ill.
Braden Mfg. Co., Terre Haute, Indiana
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Flue Thimbles.
Milwaukee Corrugating Co. Mil., Chgo., La Crosse, Kan. City

Fluxes—Soldering.
Kester Soldering Co., Chicago, Ill.

Furnace Cement.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Eller Mfg. Co., Canton, Ohio
Lastik Products Corp., Pittsburgh, Pa.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Furnace Cement—Liquid.
Technical Products Co., Pittsburgh, Pa.

Furnace Paste.
Larsen-Bennett Co., Omaha, Neb.

Furnace Cleaners—Suction.
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio.
Williamson Heater Co., Cincinnati, Ohio

Furnace Fans.
American Foundry & Furnace Co., Bloomington, Ill.
A-C Mfg. Co., Pontiac, Ill.
Brundage Co., The, Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
A. H. Robinson Co., Massillon, Ohio
Watt Mfg. Co., Sterling, Ill.

Furnace Regulators.
H. M. Sheer Co., Quincy, Ill.

Furnace Rings.
Eller Mfg. Co., Canton, Ohio
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Milwaukee Corrugating Co., Milwaukee, Wis.

Furnace Switch—Automatic.
Payne Furnace & Supply Co., Beverly Hills, Cal.
A. H. Robinson Co., Massillon, Ohio

Furnaces—Gas.
Payne Furnace & Supply Co., Beverly Hills, Cal.
A. H. Robinson Co., Massillon, Ohio
Rudy Furnace Co., Dowagiac, Mich.

Furnaces—Warm Air.
Agricola Furnace Co., Gadsden, Ala.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
Brillion Furnace Co., Brillion, Wis.
Emrich Co., C., Columbus, Ohio
Farris Furnace Co., Springfield, Ill.
Forest City-Walworth Run Fdy., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess Warming & Ventilating Co., Chicago, Ill.
Langenberg Mfg. Co., St. Louis, Mo.
London Furnace Co., London, Ohio
Lennox Furnace Co., Marshalltown, Iowa, Syracuse, N. Y.
Marshall Furnace Co., Marshall, Mich.
May Fiebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., The, Peoria, Ill.
Midland Furnace Co., Columbus, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Premier Warm Air Heater Co., Dowagiac, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Richardson & Boynton Co., New York, N. Y.
Robinson Co., A. H., Massillon, Ohio
Standard Fdy. & Furnace Co., De Kalb, Ill.
Success Heater Mfg. Co., Des Moines, Ia.
R. J. Schwab & Sons Co., Milwaukee, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steel Products Co., Duluth, Minn.
Wise Furnace Co., Akron, Ohio

Gas Burning Attachments.
Munkel-Rippel Heating Co., Columbus, Ohio

Grilles.
Auer Register Co., Cleveland, Ohio
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Highton & Sons, Wm., Nashua, N. H.
Independent Register & Mfg. Co., Cleveland, Ohio

Guards—Machine and Belt.
Harrington & King Perforating Co., Chicago, Ill.

Handles—Boiler.
Berger Bros. Co., Philadelphia, Pa.

Handles—Soldering Iron.
Hyro Mfg. Co., New York, N. Y.

Handles—Furnace Door.
Fanner Mfg. Co., Cleveland, Ohio

Hangers—Eaves Trough.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Eller Mfg. Co., Canton, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Heat Regulation Systems.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
H. M. Sheer Co., Quincy, Ill.

Heaters—Cabinet.
Fox Furnace Co., Elyria, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Heaters—Combination Hot Water.
Alamo Heater Co., Chicago, Ill.
Standard Fdy. & Furnace Co., De Kalb, Ill.

Heaters—Domestic Hot Water.
Alamo Heater Co., Chicago, Ill.
Standard Fdy. & Furnace Co., De Kalb, Ill.

Heaters—School Room.
Meyer Furnace Co., The, Peoria, Ill.
Western Steel Products Co., Duluth, Minn.

Hotels.
Fort Shelby Hotel, Detroit, Mich.

Humidifiers.
Diener Mfg. Co., G. W., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
H. M. Sheer Co., Quincy, Ill.
Watt Mfg. Co., Sterling, Ill.

Lath—Expanding Metal.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Machines—Crimping.
Bertsch & Co., Cambridge City, Ind.

Machinery—Culvert.
Bertsch & Co., Cambridge City, Ind.

Machines—Tinsmith's.
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
La Salle Machine Works, Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Metals—Perforated.
Harrington & King Perforating Co., Chicago, Ill.

Miters.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Miters—Eaves Trough.
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Braden Mfg. Co., Terre Haute, Indiana
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Nails—Copper & Brass.
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.

(Continued on page 56)

Whitney Hand Punch No. 6

The Ideal Punch for:—

Skylight Work—Flange Punching
Button Punching

No. 6 Punch

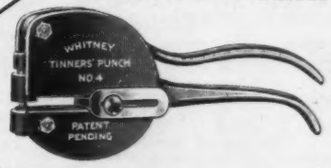
Capacity:—
1/4 inch Hole Through
3/16 inch Iron

Punches:—
1/8 inch to 9/32 inch
by 1/32nds

Better Work With Less Labor
W. A. WHITNEY MFG. CO. TOOLS
OVER 40,000 IN ACTUAL SERVICE

TRADE WAN MARK REGISTERED

No. 4
Tinners' Punch



Capacity:—
1/4 inch Hole Through 16 Gauge
Punches:—
1/16 inch to 17/64 inch by 1/64

Punch and Die Stay in Perfect Alignment Because
Side Plates Carry the Strain
Has Adjustable Gauge to Regulate Holes
from Edge

TRADE WAN MARK REGISTERED

W. A. WHITNEY MFG. CO.

636 Race Street — *Established 1908* — Rockford, Ill.

Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work
MULTIPLE PUNCH
Capacity 1/2" holes in 1/4" plate
BERTSCH & CO.
Cambridge City
Indiana

IF there is a tool or machine that you need and you don't know where to get it—

Write to the

Notes and Queries Dept.

of

AMERICAN ARTISAN

TRADE
B B
MARK

"SHUR-LOCK" CONDUCTOR PIPE
"E-Z FIT" EAVES TROUGH
EAVES TROUGH HANGERS
"QUAKER CITY" MITERS
END PIECES, CAPS
AND OUTLETS
PIPE HOOKS
PIPE FASTENERS
CONDUCTOR HEADS
ORNAMENTAL CONDUCTOR
STRAPS AND ENDS

Look for B. B. on Every Piece—it is a Mark of Quality

SOLD BY LEADING JOBBERS
EVERYWHERE

BERGER BROS. CO.

229 to 237 Arch St. — Philadelphia, Pa.

Western Office: 140 So. Dearborn St., CHICAGO

BUYERS' DIRECTORY

(Contniued from page 54)

Nails—Hardened Masonry.
Parker-Kalon Corp., New York, N. Y.

Oil Burners.
Crystal Oil Burner Corp., New York, N. Y.
McIlvaine Burner Corp., Evanston, Ill.

Ornaments—Sheet Metal.
Eller Mfg. Co., Canton, Ohio
Miller & Doing, Inc., Brooklyn, N. Y.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Paint.
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Perforated Metals.
Harrington & King Perforating Co., Chicago, Ill.

Pipe and Fittings—Furnace.
Eller Mfg. Co., Canton, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Lamneck Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland Ohio
Peerless Foundry Co., Indianapolis, Ind.

Pipe and Fitings—Stove.
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Pipe—Conductor.
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Presses.
La Salle Machine Works, Chicago, Ill.

Pipe Covering.
Sall Mountain Co., Chicago, Ill.

Punches.
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.
La Salle Machine Works, Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
W. A. Whitney Mfg. Co., Rockford, Ill.

Punches—Combination Bench and Hand.
Hyro Mfg. Co., New York, N. Y.

Punches—Hand.
Hyro Mfg. Co., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

Putty—Stove.
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Radiator Cabinets.
The Hart & Cooley Mfg. Co., New Britain, Conn.

Ranges—Gas.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Registers—Warm Air.
Auer Register Co., Cleveland, Ohio
Eller Mfg. Co., Canton, Ohio
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Harl & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Register & Mfg. Co., Cleveland, Ohio
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Rock Island Register Co., Rock Island, Ill.
Symonds Register Co., St. Louis, Mo.

Registers—Wood.
American Wood Register Co., Plymouth, Ind.
Auer Register Co., Cleveland, Ohio
Eller Mfg. Co., Canton Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Regulators—Heat.
H. M. Sheer Co., Chicago, Ill.

Ridging.
American Rolling Mill Co., Middletown, Ohio
Eller Mfg. Co. Canton, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Rivets—Stove.
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Rods—Stove.
Lamson & Sessions Co., Cleveland, Ohio

Rolls—Forming.
Bertsch & Co., Cambridge City, Ind.

Roofing Cement.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.

Roof Paints.
Lastik Products Corp., Pittsburgh, Pa.

Roof—Flashing.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Milwaukee, Wis.

Roofing—Iron and Steel.
American Rolling Mill Co., Middletown, Ohio
Central Alloy Steel Corp., Massillon, Ohio
Eller Mfg. Co., Canton, Ohio
Inland Steel Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Sons, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Roofing—Tin.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Taylor Co., N. & G., Philadelphia, Pa.

Rubbish Burners.
Hart & Cooley Co., New Britain, Conn.

Schools—Sheet Metal Pattern Drafting.
St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating.
St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Parker-Kalon Corp., 200 Varick St., New York

Screens—Perforated Metal.
Harrington & King Perforating Co., Chicago, Ill.

Shears—Hand and Power.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Viking Shear Co., Erie, Pa.

Sheet Metal Screws—Hardened, Self-Tapping.
Parker-Kalon Corp., 200 Varick St., New York

Sheets—Alloy.
Central Alloy Steel Co., Massillon, Ohio
International Nickel Co., New York, N. Y.

Sheets—Black and Galvanized.
American Rolling Mill Co., Middletown, Ohio
Central Alloy Steel Corp., Massillon, Ohio
Eller Mfg. Co., Canton, Ohio
Inland Steel Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
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Central Alloy Steel Corp., Massillon, Ohio
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
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Sheets—Tin.
Taylor Co., N. & G., Philadelphia, Pa.

Shingles and Tiles—Metal.
Eller Mfg. Co., Canton, Ohio
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Sifters—Ash.
Diener Mfg. Co., G. W., Chicago, Ill.

Sky Lights.
Eller Mfg. Co., Canton, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Smoke Pipe—Cast Iron.
Waterloo Register Co., Waterloo, Ia.

Snips.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Solder—Acid Core.
Kester Solder Co., Chicago, Ill.

Solder—Self-Fluxing.
Kester Solder Co., Chicago, Ill.

Solder—Rosin Core
Kester Solder Co., Chicago, Ill.

Solder.
Eller Mfg. Co., Canton, Ohio
Kester Solder Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Soldering Coppers.
Revere Copper & Brass, Rome, N. Y.

Soldering Furnaces.
Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Specialties—Hardware.
Diener Mfg. Co., G. W., Chicago, Ill.

Stars—Hard Iron Cleaning.
Fanner Mfg. Co., Cleveland, Ohio

Statuary.
Miller & Doing, Inc., Brooklyn, N. Y.

Stove Pipe Reducers.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City

Tinplate.
Eller Mfg. Co., Canton, Ohio
Milwaukee Corrugating Co., Mil., Chgo., La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

Tools—Tinsmith's.
Bertsch & Co., Cambridge City, Ind.
Dries & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Viking Shear Co., Erie, Pa.

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Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

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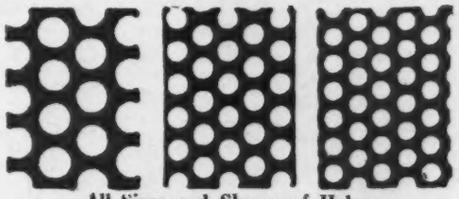

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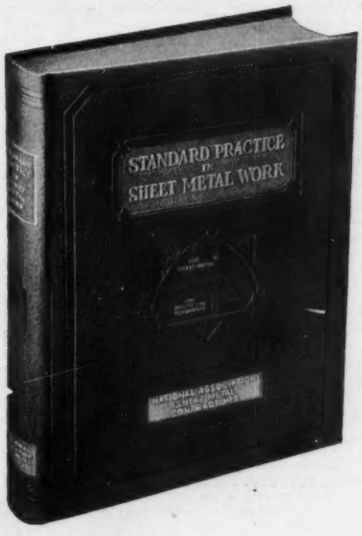

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WANTS AND SALES

Yearly subscribers to the AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE for three insertions.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired and must reach our office ten days prior to date of publication. This privilege is not extended to manufacturers or jobbers—or those making a business of buying and selling used machines—employment agencies and brokers.

When sending advertisement state whether your name or blind number is to be used.

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Lightning Rods—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddie Company, Marshfield, Wis.

For Sale—Sheet metal, plumbing and ox-welding business in town of 1,500 in Michigan. Complete tools, benches and Ford truck and stock. Established 12 years. Easy competition. Ill health the reason for selling. Will sell for less than $2,000. Address F-517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted to Buy—Small sheet metal shop in town of 10,000 or less. Prefer Arkansas, Mississippi or Georgia—or will buy half interest in shop. This must be a shop making money. Will pay part cash and balance monthly. Address W. H. S., 1505 Arlington Ave., Bessemer, Alabama. Z-518

For Sale—Well equipped sheet metal and plumbing shop in Eastern Oregon. Railroad division point and pay roll town. Good opening for sheet metal worker familiar with furnace, steam and hot water heating. Address P. O. Box 486, La Grande, Ore. R-517

For Sale — Well equipped plumbing, heating and sheet metal shop. Only shop in town of 1,600 population. Centrally located. Six good sized living rooms in connection. Good chance for a hustler. Address A-519, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Hardware heating and plumbing business in county seat town of 2,700. Good drawing territory. Reason for selling, owner and proprietor died. $4,500 to $5,000 will handle deal. Address A. O. Bishop, 308 N. Fifth St., Marshalltown, Iowa. Y-517

For Sale—Sheet metal shop on the North side of Chicago. $3,000 will handle it. Complete equipment—truck, machinery and stock. Price, $4,600. Address M-517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For sale in DuQuoin, Illinois, an old established tin shop. Must sell on account of ill health. Will rent building reasonably. Enquire Fred Steinwax, Box 175, DuQuoin, Illinois. B-519

Business for Sale—Sheet Metal and Plumbing Shop, good equipment, good town, and worth the money. Address F-518, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

BUSINESS CHANCES

For Sale—Plumbing, heating and sheet metal business in one of the fastest growing towns in the Northwest. Population has been doubled in the past 5 years. Is now 18,000. Stock will invoice about $10,000. Plenty of business for anyone who will hustle. Reason for selling, poor health. Address L. N. Haines, 1023 Main, Klamath Falls, Oregon. A-518

For Sale — Sheet metal, radiator, fender and body repair shop including welding machine and blacksmith shop. Doing fine business and plenty of work. I have made enough money and wish to retire. Will sell for $3,000.00. Address George Warga, Box 325, Live Oak, Fla. G-518

SITUATION WANTED

This as addressed to a manufacturer who harps on quality furnaces and intelligent installations. If such a manufacturer needs a salesman manager or assistant sales manager. I would like to hear from him. For ten years I helped market a well-known furnace. Served in sales promotion and advertising departments as a salesman and as branch manager. Thorough investigation as to character and ability invited. Communications strictly confidential. Address F-519, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation wanted by first-class plumber and furnace man. Have had 38 years' experience in plumbing and heating, 10 years' experience in warm air heating, and was in a construction shop doing plumbing for 10 years. Would like to get on the road with some firm in Iowa, Wisconsin or Minnesota. Iowa preferred. Will take a job with some good firm as foreman. Am 47 years old and in good health. Address W. S. Porter, Box 50, Hazleton, Iowa. L-517

Experienced furnace salesman is open for contract. Thoroughly understands warm air heating and forced ventilation. Would be interested in contacting reliable dealer in good town to help combat chain competition. Can take complete charge of installation if necessary. Address K-518, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Ill.

Would like to get in touch with hardware company, Nebraska preferred, who can use a middle aged combination plumber, fitter and general heating man. Steady and reliable. Can do estimating and layout. Address L-518, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Ill.

Situation wanted by an experienced heating engineer and salesman. Sober and reliable. Employed at present, but looking for a better opportunity. Address Z-517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation wanted by a tinner and furnace man. Capable of taking full charge of this line of work. Am also a hardware clerk. Have had years of experience in these lines. Address X-517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Superintendent, ventilation, humidity, blower systems; industrial, manufacturing and production; layout, fabrication and erection. Any location. Address J-518, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Ill.

Situation wanted by practical tinner and furnace installer. Reliable, competent workman, active and steady. Good on gutters and all outside work. Can start at once. Address E-519, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Young man with seven years' experience, desires a position as plumber, tinner and sheet metal worker. First class, reliable and steady. Heinrich Albers, 1565 N. Halsted St., Chicago, Ill. C-519

Position wanted by a real furnace man, tinner, roofer, estimator and producer. Wages reasonable. Address D-519, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Il.

Situation wanted by first-class tinner, sheet metal worker and plumber. Would like position in connection with hardware store. Address J-517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SITUATION WANTED

Situation wanted, foreman or superintendent. Young married man, strictly temperate and reliable. 36 years old, with 19 years' experience in all branches of the trade. Am a good pattern draftsman and can read blue prints and produce results, and have had three years of efficient experience in mass production in furnace factory fittings and in directing help efficiently. Employed at present, but looking for larger opportunity. Address C-517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation wanted by thoroughly experienced salesman who can sell a good line of steel furnaces and furnace accessories. Have had 25 to 30 years experience in the furnace business and can show a good clean record as a sales producer. Prefer Ohio, Eastern Ohio or western Ohio, as I am best known in these sections. Best of references. Address R-518, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Young man, married, sober and industrious, desires to make connections in any capacity with reliable heating and ventilating company or contractor. Experienced in steam engineering, heating, steam fitting, machine shop, sheet metal, hot air, drafting and refrigeration. Can estimate and lay out work. Am interested in heating, and am making a study of it. Address S-517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation wanted by a tinner and plumber. Can run shop, lay out or work from blue prints. Wide experience in house plumbing, tin, copper, slate and composition roofing and spouting. Very good at difficult warm air work. Do hot water and steam fitting. Will go anywhere on week's notice. Address D-517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Position Wanted: I am looking for connection with some well known, high grade Furnace and Boiler concern—or for a boiler or furnace concern, separately. 19 years with last concern. Want connection with concern with A-1 reputation and with high quality merchandise. Address O-518, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation wanted by a first class sheet metal worker; 25 years' experience. Can read blue prints, cut patterns and handle any kind of sheet metal work that may come to job shop. Employed at present but wish to make change. Can go anywhere. Address P. O. Box 681, Dothan, Alabama. M-518

Situation Wanted by first-class sheet metal worker and furnace setter. Can take full charge of shop and do estimating. 28 years of experience. Can furnish good references. Married and sober. Address B. J. Hawkins, 314 No. Howell St., Owosso, Michigan. P-518

Situation wanted by competent plumber and tinner. Have Illinois and Wisconsin license. Sober and reliable. Able to handle and take charge of any job in the above lines. Also good furnace man. Address P-517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

HELP WANTED

Wanted—Good all around tinner and furnace man. Steady employment and good opportunity for right man. Must be sober and able to furnish reference. Protestant. City of 7,000. Address T-518, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

Wanted—First class sheet metal workers for ventilating, furnace and general sheet metal work. State age and experience in first letter. Location, Northeastern Iowa. Address G-519, AMERICAN ARTISAN, 139 N. Clark St., Chicago.

Wanted—Experienced plumber's helper and plumber who can do some tinning preferred but not necessary. State wages and ability in first letter. Address S. W. Laceby, Mackinac Island, Michigan. H-519

Wanted—Experienced hardware clerk, one able to do book work. Address Randolph Hardware Co., Randolph, Wis. S-518

HELP WANTED

Wanted—To hear from a sheet metal worker that would like to get into business for himself. Must be an industrious and steady man, a first class worker and one who can take charge and manage. This shop is now in operation for the tenth year, fully equipped and doing business. No capital required. Have a fine proposal for the right man. Address Claud Ranf, Ranf Sheet Metal Works, Ludington, Mich. J–519

Help Wanted—I want a working foreman, a live man, one that is able to take full charge of a first-class sheet metal business that does some blowpipe and ventilating jobs—cornice and skylight. You will waste time answering this ad unless you are an expert bench hand that knows the business from A to Z. I mean business. Harry I. Klugel, North Emporia, Virginia. B–518

Wanted—Five sheet metal workers, one experienced foreman, also experienced solicitor and estimator. Large shop, well equipped, doing cornice, skylight, ventilating, blow pipe and general sheet metal work on a large scale. Address L–519, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Would like to get in communication with a good plumber and tinner. One that can do acetylene welding and cutting, also good on repairing auto radiators. $1.00 per hour. Union man preferred and one who can drive a Dodge truck. Address Robert E. Hearst, Kane, Pa. K–519

Wanted at Once—An all-around man to do class of work that comes in a country tin shop. Must be able to do some plumbing and drive a car. Want a sober man and one who will be on the job. Wages $30.00 year around. Address O. L. Doward, Mt. Morris, Ill. K–517

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For Sale—Switch cabinet factory and tools—one 72 inch box and pan brake, 220 A. C.—800 Ampt. spot welder, two electric drills, one heavy screw punch, one power punch, 36 inch squaring shear, one steel work truck on casters, rools, crimper, 36 inch hand sheaves, stock and material. Going at $650.00. Chas. F. Barnum, Mankato, Minn. X–518

Wanted to Buy—One 4-ft. cornice brake in good working condition and at a bargain. Write me giving your description and best price. Address S. E. Ethridge, 1103 Denison, Little Rock, Ark. W–519

For Sale—Complete set of tinners' tools, as good as new. Must be seen to be appreciated. Cheap if taken at once. Address R–519, AMERICAN ARTISAN, 139 North Clark St., Chicago, Ill.

For Sale — Complete welding outfit, suitable for auto body and fender work. Cheap. Also body tools. Address Kimball Tin and Radiator Shop, Kimball, Nebr. M–519

Sheet Metal Tools for Sale—Have discontinued shop. Write for list of tools and prices. Address Horel-George Co., Eau Claire, Wis. X–519

Wanted—One hundred to one hundred fifty pound metal paper baler that operates easy and quick. Address Ed. A. Knabe, Rock Falls, Ill. T–519

For Sale—Two slightly used 8 foot 18 gauge Chicago steel bending brakes. Like new. Address Rockfors Sheet Steel Co., Rockford, Ill. W–518

For Sale for $8.00. 1 38"x38"x28" collar ox. copper cast iron register in original crate. Address E. Moyemont, Odell, Illinois. P–519

For Sale—Fifth to seventy-five pound all metal paper baler in good condition. Address Ed. A. Knabe, Rock Falls, Ill. S–519

Wanted — One Beakhorn Stake; name price. Address C. L. Koons, 240 W. High Ave., New Philadelphia, Ohio. O–519

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We have approximately 300 pieces of Hart & Cooley 170 Series Side Wall Registers, all new stock, most of it in the original crates. Sizes 8x10, 8x12, 11x13 and 12x14. Finishes: oxidized copper, lacquered antique brass, white japan, black japan and nickel. We offer this stock at a sacrifice price to move it in bulk. Address Waterman-Waterbury Company, 1121–1135 Jackson St., N. E., Minneapolis, Minn. E–517

Furnace Line Wanted—Manufacturer's agent wants a line of modern all cast iron furnaces for western New York and Pennsylvania territory, on commission basis. Goods and prices must be right. Address T–517, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Correspondence course on sheet metal design and pattern drafting. Address Y–518, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

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two or three retail furnace salesmen as managers of the furnace departments of established Torrid Zone dealers. Must be thoroughly competent to manage both sales and installations, have business producing records and furnish satisfactory references. Interest in business of two of these places can be secured with small amount of capital if you are the right man. Address Lennox Furnace Company, Syracuse, New York. E-518

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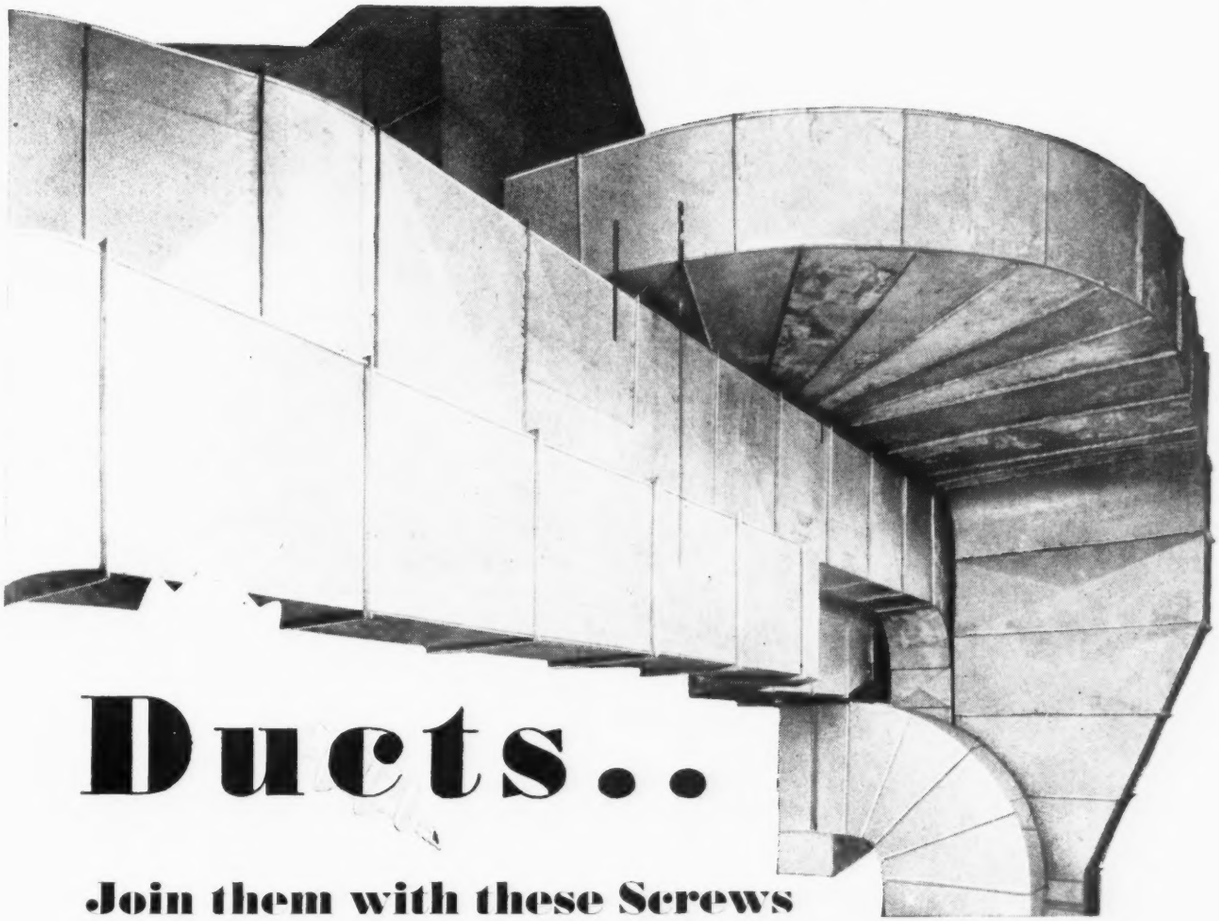

Ducts..

Join them with these Screws to save time, labor and money

YOU will be amazed when you see how fast ducts can be installed with Hardened Self-tapping Sheet Metal Screws. The sections are joined with a minimum of time and labor. Your profits from the job are bound to be larger. This has been proved by thousands of sheet metal workers who use these Screws for every installation.

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Sheet Metal Screws

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No easier, quicker, cheaper way

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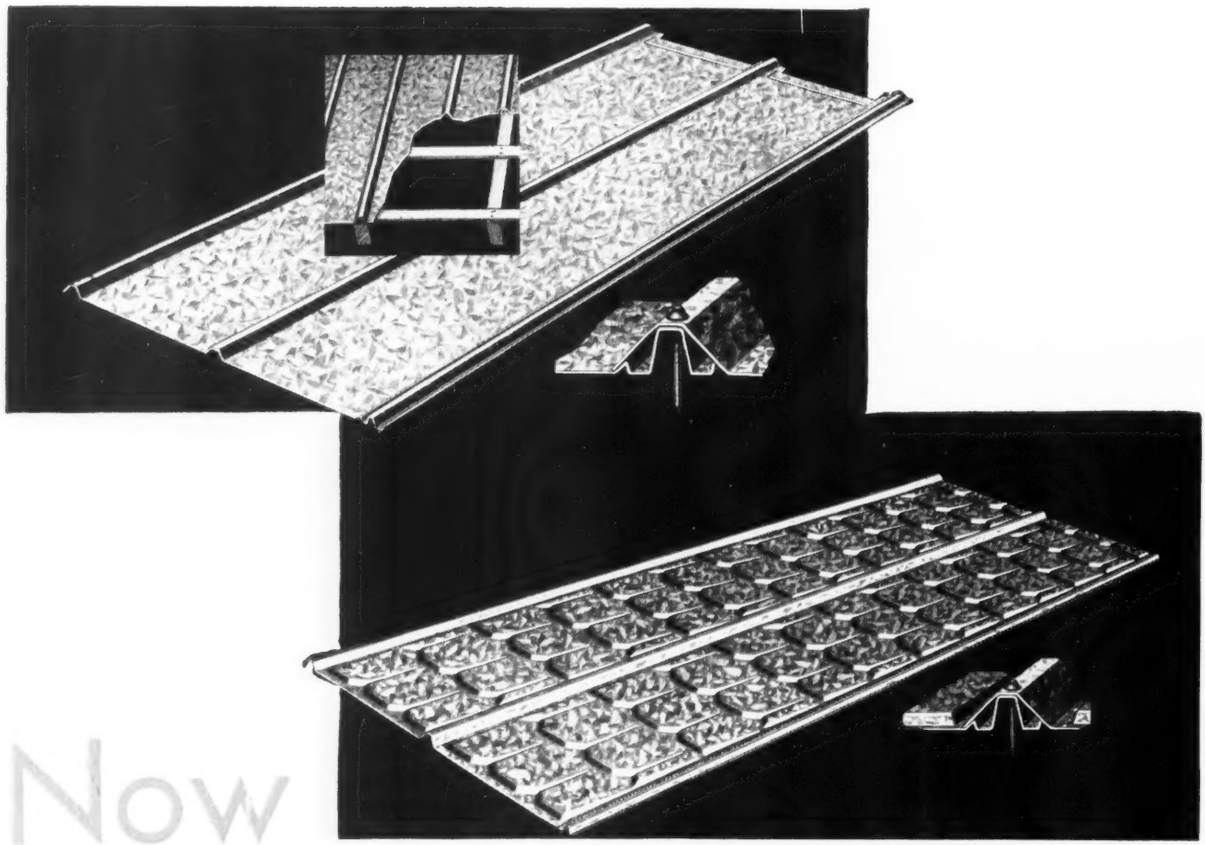

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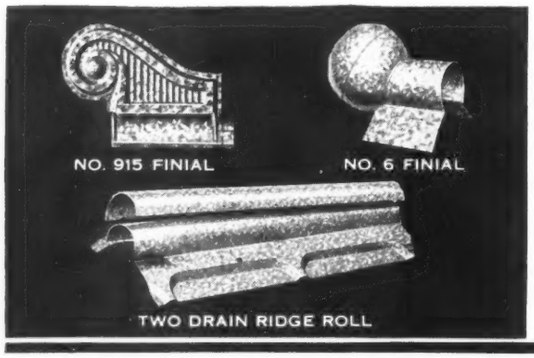

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